SANYO

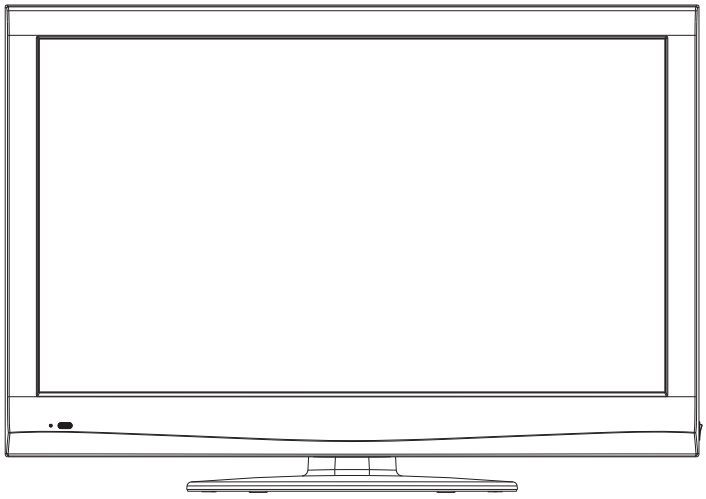
FILE NO.

SERVICE MANUAL

LCD TV

LCD-19XR9DA

PRODUCT CODE No.
1 682 346 34: PAL-BG(TV) DTV



REFERENCE No.:SM0915063

CONTENTS

Safety precautions…… 1
Alignment instructions …… 3
Method of software upgrading…… 8
Working principle analysis of the unit…… 12
Block diagram…… 13
IC block diagram…… 14
Wiring diagram …… 25
Troubleshooting guide …… 26
Schematic diagram…… 31
APPENDIX-A: Assembly list
APPENDIX-B: Exploded View

Attention: This service manual is only for service personnel to take reference with. Before servicing please read the following points carefully.

Safety precautions

1. Instructions

Be sure to switch off the power supply before replacing or welding any components or inserting/plugging in connection wire Anti static measures to be taken (throughout the entire production process!):

a) Do not touch here and there by hand at will;

b) Be sure to use anti static electric iron;

c) It's a must for the welder to wear anti static gloves.

Please refer to the detailed list before replacing components that have special safety requirements. Do not change the specs and type at will.

2. Points for attention in servicing of LCD

2.1 Screens are different from one model to another and therefore not interchangeable. Be sure to use the screen of the original model for replacement.

2.2 The operation voltage of LCD screen is 700-825V. Be sure to take proper measures in protecting yourself and the machine when testing the system in the course of normal operation or right after the power is switched off. Please do not touch the circuit or the metal part of the module that is in operation mode. Relevant operation is possible only one minute after the power is switched off.

2.3 Do not use any adapter that is not identical with the TV set. Otherwise it will cause fire or damage to the set.

2.4 Never operate the set or do any installation work in bad environment such as wet bathroom, laundry, kitchen, or nearby fire source, heating equipment and devices or exposure to sunlight etc. Otherwise bad effect will result.

2.5 If any foreign substance such as water, liquid, metal slices or other matters happens to fall into the module, be sure to cut the power off immediately and do not move anything on the module lest it should cause fire or electric shock due to contact with the high voltage or short circuit.

2.6 Should there be smoke, abnormal smell or sound from the module, please shut the power off at once. Likewise, if the screen is not working after the power is on or in the course of operation, the power must be cut off immediately and no more operation is allowed under the same condition.

2.7 Do not pull out or plug in the connection wire when the module is in operation or just after the power is off because in this case relatively high voltage still remains in the capacitor of the driving circuit. Please wait at least one minute before the pulling out or plugging in the connection wire.

2.8 When operating or installing LCD please don't subject the LCD components to bending, twisting or extrusion, collision lest mishap should result.

2.9 As most of the circuitry in LCD TV set is composed of CMOS integrated circuits, it's necessary to pay attention to anti statics. Before servicing LCD TV make sure to take anti static measure and ensure full grounding for all the parts that have to be grounded.

2.10 There are lots of connection wires between parts behind the LCD screen. When servicing or moving the set please take care not to touch or scratch them. Once they are damaged the screen

would be unable to work and no way to get it repaired.
If the connection wires, connections or components fixed by the thermotropic glue need to disengage when service, please soak the thermotropic glue into the alcohol and then pull them out in case of dagmage.
2.11 Special care must be taken in transporting or handling it. Exquisite shock vibration may lead to breakage of screen glass or damage to driving circuit. Therefore it must be packed in a strong case before the transportation or handling.
2.12 For the storage make sure to put it in a place where the environment can be controlled so as to prevent the temperature and humidity from exceeding the limits as specified in the manual. For prolonged storage, it is necessary to house it in an anti-moisture bag and put them altogether in one place. The ambient conditions are tabulated as follows:

Temperature	Scope for operation	5 ~ +40 ^{o}C
	Scope for storage	-20 ~ +60 ^{o}C
Humidity	Scope for operation	20% ~ 85%
	Scope for storage	10% ~ 90%

2.13 Display of a fixed picture for a long time may result in appearance of picture residue on the screen, as commonly called “ghost shadow”. The extent of the residual picture varies with the maker of LCD screen. This phenomenon doesn’t represent failure. This “ghost shadow” may remain in the picture for a period of time (several minutes). But when operating it please avoid displaying still picture in high brightness for a long time.

3. Points for attention during installation

3.1 The front panel of LCD screen is of glass. When installing it please make sure to put it in place.
3.2 For service or installation it’s necessary to use specified screw lest it should damage the screen.
3.3 Be sure to take anti dust measures. Any foreign substance that happens to fall down between the screen and the glass will affect the receiving and viewing effect
3.4 When dismantling or mounting the protective partition plate that is used for anti vibration and insulation please take care to keep it in intactness so as to avoid hidden trouble.
3.5 Be sure to protect the cabinet from damage or scratch during service, dismantling or mounting.

Alignment instructions

1. Test equipment

VG-848 (YPbPr,VGA signal generator)

VG-849 (HDMI signal generator)

CA210 (white balancer)

2. Power test

Connect power board, digital processing board, IR board and backlight board according the wiring diagram, connect the power and press ⏻ to turn on the TV.

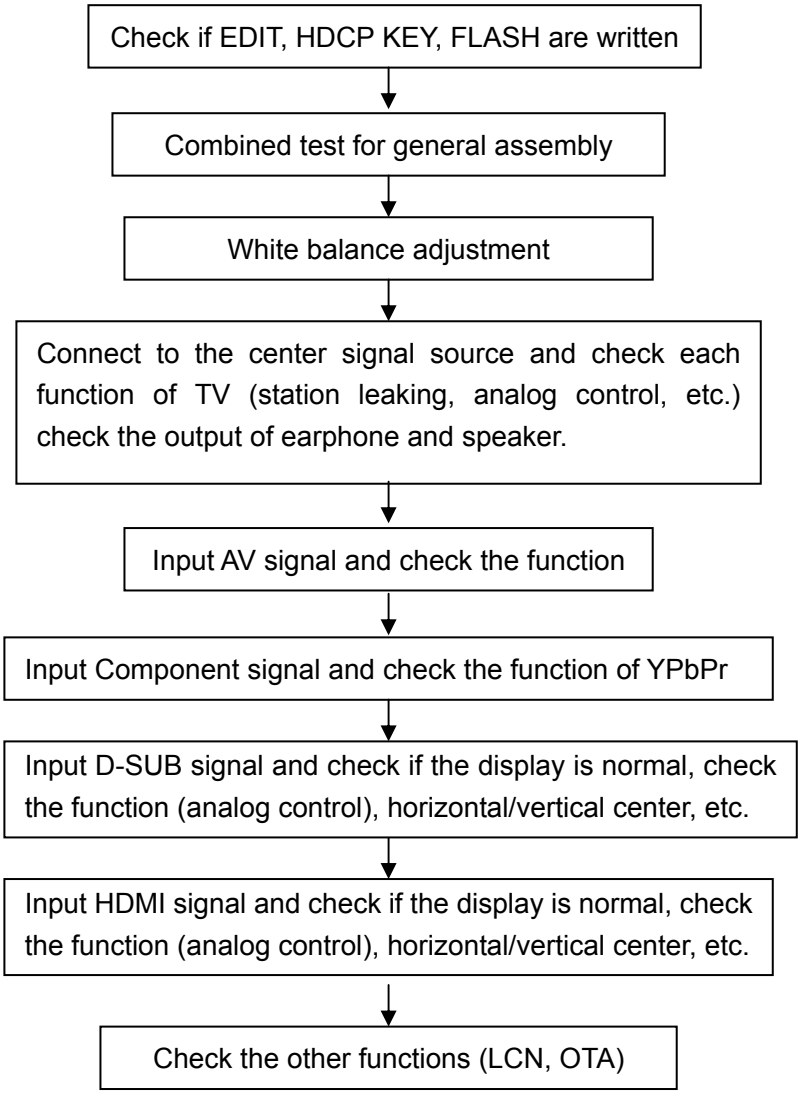
Test the pin voltage of X401, the data is shown in table1:

Table1 voltage data of X401

X401	Pin1	2	3	4,5	6,7	8	9	10	11	12	13
Voltage	≤3.3V	0	≤3.3V	12V±5%	0	32V±5%	5V±5%	0	5V±5%	0	≤3.3V

3. Alignment flow-chart

The alignment flow-chart is shown as fig-1


Check if EDIT, HDCP KEY, FLASH are written
Combined test for general assembly
White balance adjustment
Connect to the center signal source and check each function of TV (station leaking, analog control, etc.) check the output of earphone and speaker.
Input AV signal and check the function
Input Component signal and check the function of YPbPr
Input D-SUB signal and check if the display is normal, check the function (analog control), horizontal/vertical center, etc.
Input HDMI signal and check if the display is normal, check the function (analog control), horizontal/vertical center, etc.
Check the other functions (LCN, OTA)

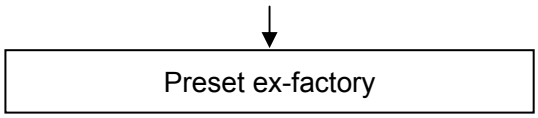


Fig-1 adjustment flow-chart

4. Adjustment instruction

4.1 Unit adjustments

4.1.1Connect all the boards according to wiring diagram, then power on and observe the display.

4.1.2 Method for entering factory menu:

a) Press “SOURCE”, “2”, “5”, ”8” and “0” in turn to enter factory menu;
b) Press “▲” and “▼” to move the cursor to the adjustment page of the level one factory menu, then press ”OK” to enter;
c) Press “▲” and “▼” to move the cursor up and down;
d) Press “◀” and “▶” to adjust the item when the cursor move to a certain adjust item;
e) Press “MENU” to exit to the previous factory menu;
f) Press “EXIT” to exit the factory menu at any situation;
g) Press “OK” to enter the sub factory menu;
h) **ADC ADJUST**, ADC correction of VGA, Component channel;
i) **W/B ADJUST**, white balance adjustment;
j) **POWER MODE**, set the turn-on modes. Standby---standby when power on; Mem---memory; ForceOn---power on; ForceOn can be used for aging; set the “power mode” to “Standby” when preset ex-factory unless the client appointed it;
k) **ISP MODE**, ON---soft upgrading through VGA port with ISP instrument, OFF---DDC function of VGA; the setting will not be memory and will be “OFF” when power on again;
l) **RESTALL**, initialization of the factory and user data; after this item is confirm, the unit will restart and display the guiding image.
m) **FACTORYDATAREST**, factory data initialization (including white balance adjustment, ADC correction and other adjusted data);
n) **FACEORY Channel PRESET**, preset the factory channel; please connect to the center signal source when operating; the present digital frequency is CH28(529.5MHz), CH33(564.5MHz) for Australia, if the signal changes, perform “DTV manual search” in “Channel” menu and the operation needs 15s or so.
o) **CUSTOM Channel PRESET**, preset the custom ATV channel, they are CH2(66.5MHz), CH7(184.5MHz), CH9(198.5MHz), CH10(212.5MHz), CH28(529.5MHz);
p) **MST DEBUG**, the default is OFF. OFF---RS-232 should match the design criterion; ON--- it should be convenient for using exploitation tool to adjust. The setting will not be memory and will be “OFF” when power on again;
q) **BACKLIGHT**: adjust the backlight brightness, adjust the data and test the voltage of X804 pin2 (PWM), let the voltage to be the corresponding PWM voltage which the brightness is maximum. It will be preset and doesn’t need adjust.
r) **SSC ADJUST**, adjust the frequency spectrum expand, it will be preset and doesn’t need adjust.
s) **AUDIO CURVE**, adjust the sound curve, it will be preset and doesn’t need adjust.
t) **RF AGC delay Adj**, adjust ATV RF AGC-take;
u) There is data in EEPROM after software upgrade, please perform REST ALL before the first adjustment.

4.1.3 ADC correction in D-SUB channel

a) Switch to D-SUB channel
b) Press" SOURCE", then press "2, 5, 8, 0" in turn to enter the level one factory menu.
c) Move the cursor to "ADC ADJUST" and press OK to enter the sub-menu.
d) Input D-SUB signal (VG-848 Timing:856(1024x768/60Hz), Pattern:920 8step Gray). Move the cursor to "MODE", press ▲ and ▼ to select "RGB", move the cursor to "AUTO ADC" and press OK to adjust automatically till display "success".

4.1.4 ADC correction of Component channel

a) Switch to Component channel.
b) Press" SOURCE", then press "2, 5, 8, 0" in turn to enter the level one factory menu.
c) Move the cursor to "ADC ADJUST" and press OK to enter the sub-menu.
d) Input Component signal (VG-848 Timing:969(PAL), Pattern:918 100% color bar). Move the cursor to "MODE", press ▲ and ▼ to select "YPbPr(SD)", move the cursor to "AUTO ADC" and press OK to adjust automatically till display "success".
e) Input Component signal (VG-848 Timing:972(1080i), Pattern:918 100% color bar). Move the cursor to "MODE", press ▲ and ▼ to select "YPbPr(HD)", move the cursor to "AUTO ADC" and press OK to adjust automatically till display "success".

4.2 White balance adjustment

The default of color temperature of COOL is 12000K and the coordinate is (272, 278); color temperature of NORMAL is 9300K and the coordinate is (285,293), color temperature of WARM is 6500K and the coordinate is (313,329).

4.3 Adjustment steps

Before the white balance adjustment, please let the unit working at least 30 minutes and at a stable situation, use BBY channel of the white balancer CA-210 (19" for example).

a) Switch to HDMI channel;
b) Press" SOURCE", then press "2, 5, 8, 0" in turn to enter the level one factory menu.
c) Move the cursor to "W/B ADJUST" and press OK to enter the sub-menu.
d) Input HDMI signal (VG-848 Timing:856(1024X768/60Hz), Pattern:921 16 step Gray). Move the cursor to "MODE", press ▲ and ▼ to select "HDMI", move the cursor to "TEMPERTURE" and press ▲ and ▼ to select "COOL".
e) Fix G GAIN, adjust R GAIN, B GAIN and let the color coordinate of the thirteenth scale be (272,278).
f) Fix G OFFSET, adjust R OFFSET, B OFFSET and let the color coordinate of the forth scale be (272,278).
g) When adjusting, please keep the color temperature of high light to be X=272±5, Y=278±15 and the low light to be X=272±8, Y=278±30;
h) Move the cursor to "COPY ALL" and copy the data to the other channels (except DTV);
i) Check if the color temperatures of NORMAL and WARM are up to the mustard (NORMAL high light acceptable error: x±10, y±15, NORMAL low light acceptable error: x±10, y±25; WARM high light and low light acceptable error: x±10, y±10), if not, adjust R-GAIN/B-GAIN/R-OFF/B-OFF.
j) Check the white balance of other channels, if they are not up to the mustard then adjust and store the data separately.
k) Select DTV channel and 16-level gray scale signal.
l) Press "SOURCE" and "2, 5, 8, 0" one by one to enter the level one factory menu.
m) Move the cursor to "W/B ADJUST" and press OK to enter the sub-menu.

n) Move the cursor to “MODE”, press ▲ and ▼ to select “DTV”, move the cursor to “TEMPERTURE” and press ▲ and ▼ to select “COOL”.
o) Repeat the steps e)-I);
p) After adjustment, check if the pictures are normal.
q) The reference of adjustment rule is below:
B gun: lower B gun to increase X, Y coordinate data, while raise B gun to decrease the data;
R gun: raise R gun to increase X coordinate data, while lower R gun to decrease the data; (R gun adjustment will affect X and Lv slightly)
G gun: raise G gun to increase Y coordinate data, while lower G gun to decrease the data; (G gun adjustment will affect Y and Lv greatly)

5. Performance check

5.1 TV function

Connect RF to the center signal source, enter Channel menu → auto search, check if there are channels be skipped, check if the picture and speaker are normal.

5.2 AV terminals

Input AV signal, check if the picture and sound are normal.

5.3 Component terminal

Input Component signal (VG-848 signal generator), separately input the Component signals listed in table2 and check if the display and sound are normal at any situation (power on, channel switch and format switch, etc.)

Table2 Component signal format

No.	Resolution	H-frequecny (kHz)	V-frequecny (kHz)	Point clock pulse frequecny (MHz)	Note
1	72×480	15.734	60	13.5	480i (NTSC)
2	720×480	15.734	59.94	13.5	480i (NTSC)
3	720×576	15.625	50	13.5	576i (PAL)
4	720×480	31.469	60	27	480p (NTSC PROG)
5	720×480	31.469	59.94	27	480p (NTSC PROG)
6	720×576	31.25	50	27	576p (PAL PROG)
7	1280×720	45	59.94	74.18	720p (59p)
8	1280×720	45	60	74.25	720p (60p)
9	1280×720	37.5	50	74.25	720p (50p)
10	1920×1080	33.75	59.94	74.25	1080i (59i)
11	1920×1080	33.75	60	74.25	1080i (60i)
12	1920×1080	28.125	50	74.25	1080i (50i)
13	1920×1080	67.5	59.94	148.35	1080p (59p)
14	1920×1080	67.5	60	148.5	1080p (60p)
15	1920×1080	56.25	50	148.5	1080p (50p)
16	1920×1080	33.75	30	74.25	1080p (30p)
17	1920×1080	33.716	29.97	74.176	1080p (29.97p)
18	1920×1080	28.125	25	74.25	1080p (25p)
19	1920×1080	27	24	74.25	1080p (24p)
20	1920×1080	26.973	23.98	74.176	1080p (23.98p)

5.4 D-SUB terminal

Input D-SUB signal (VG-848 signal generator), separately input the signals listed in table3 and check the display and sound. If the image is deflection of the Horizontal and vertical, select Picture->Screen->Auto Adjusting to perform auto-correct.

Table3 D-SUB signal format

No.	Resolution	H-frequecny (kHz)	V-frequecny (kHz)	Point clock pulse frequecny (MHz)	Note
1	640×480	31.469	59.94	25.175	IBM
2	720×400	31.469	70.086	28.322	IBM
3	640×480	37.861	72.809	31.5	VESA
4	640×480	37.5	75	31.5	VESA
5	800×600	35.156	56.25	36	VESA
6	800×600	37.879	60.317	40	VESA
7	800×600	48.077	72.188	50	VESA
8	800×600	46.875	75	49.5	VESA
9	1024×768	48.363	60.004	65	VESA
10	1024×768	56.476	70.069	75	VESA
11	1024×768	60.023	75.029	78.75	VESA
12	1152×864	67.5	75	108	VESA
13	1280×960	60	60	108	VESA
14	1280×1024	63.98	60.02	108	VESA
15	1280×1024	80	75	135	SXGA
16	1360×768	47.7	60	85.5	WXGA
17	1440×900	55.9	60	106.5	WXGA+
18	1400×1050	65.22	60	122.61	SXGA+
19	1680×1050	65.3	60	146.25	WSXGA+

5.5 HDMI terminal

Input HDMI signal (VG-849 signal generator), separately input the signals listed in table2 and table3 and check the display and sound (32KHz, 44.1KHz, 48KHz) at any situation (power on, channel switch and format switch, etc.)

5.6 other functions check

a) Check the turn on/turn off timer, asleep timer, picture/sound mode, OSD, stereo and digital sound port, etc.
b) Check the digital program, if Audio Only is normal.
c) Check logical channel number (LCN) for Australia.
d) Check OTA function for Australia special custom.

6. Presetting before ex-factory

Enter user menu LOCK page, select “Restore Factory Default” to preset the ex-factory.

a) Clear the program information
b) Clear VCHIP, parental control, etc.
c) Set the default data of user menu

d) Set Menu Language to English
e) Set Power on Mode to Off

7. Software instruction

Table4 software instruction

No.	Code No.	Type	Function	Burn before paste	Method
N102	5272532003 or 5272532004 or 5272532005	EN25B32-100HIP or W25X32VSSIG-E or MX25L3205DM2C-12G	FLASH	Yes	Written with instrument like ALL11, write-protect, refer to note.
N104	5272404002	AT24C04	HDCP KEY	Yes	Written with instrument like ALL11
N202	5272402002	AT24C02	HDMI EDID	Yes	
N206	5272402002	AT24C02	VGA EDID	Yes	

Note: write-protect setting: enter ALL-100 interface, select Config and press “config setting”, set Protect to “All Protect”, select “config” when burning. The “write-protect” will be set again when ALL-100 program restart.

Method of software upgrading

Install FTC100103(MSTAR) before writing.
Using Mstar writing-tool on line.

1. Click Connect menu, if it displays DEVICE EN25B32 as shown in fig1, the connection is success, if displays “can’t Entry ISP Mode” shown in fig2, it needs connect again.

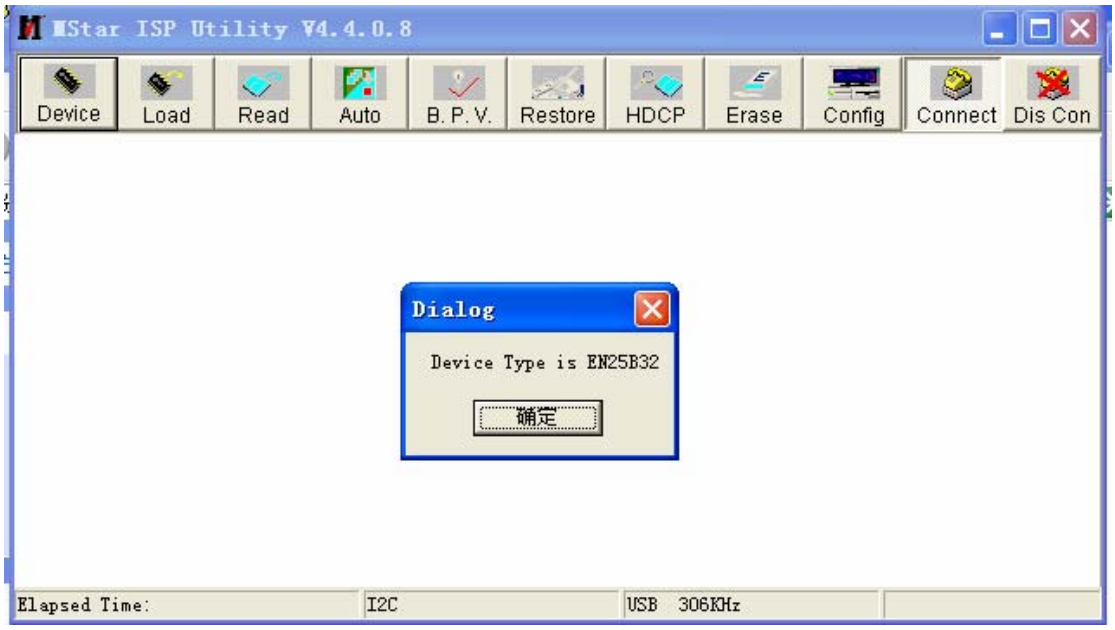


Fig1

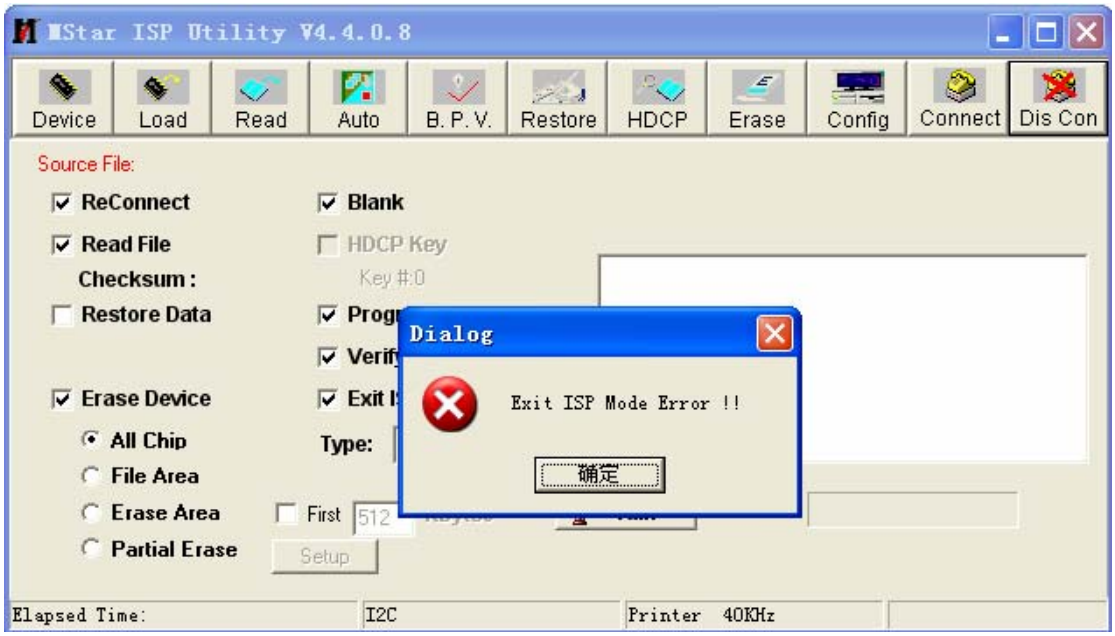


Fig2

2. Open the tool and click Device and select EN25B32 or corresponding type.

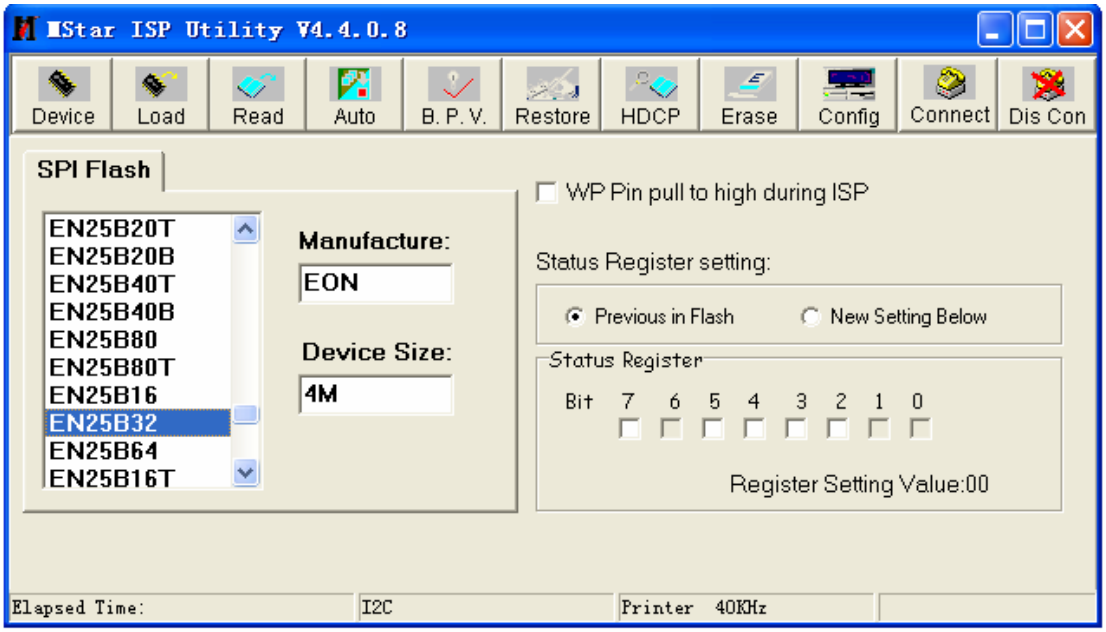


Fig3

3. Click “Read” and select the file written (MERGE.bin for example) as shown in fig4.

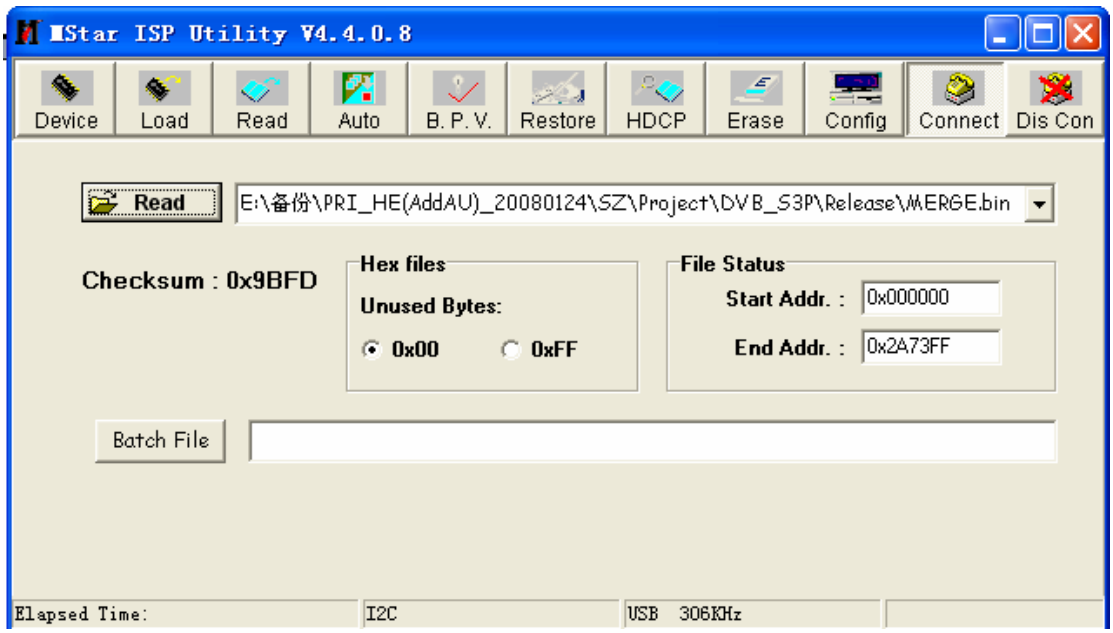


Fig4

4. Click “Auto”, select “All chip” and “programme” and click “Run” to begin writing.

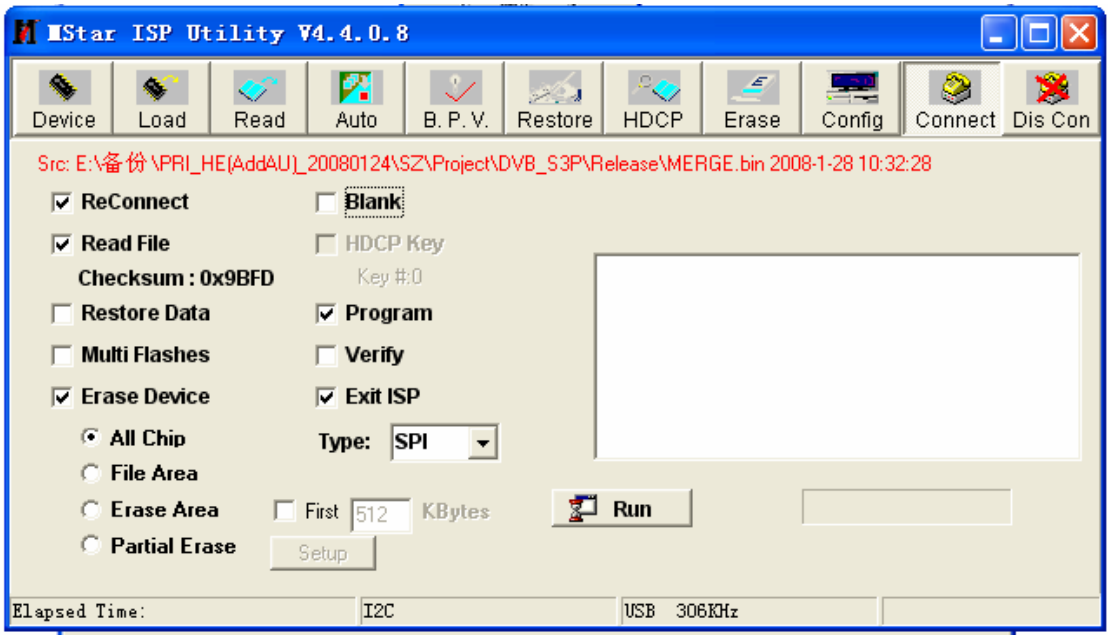


Fig5

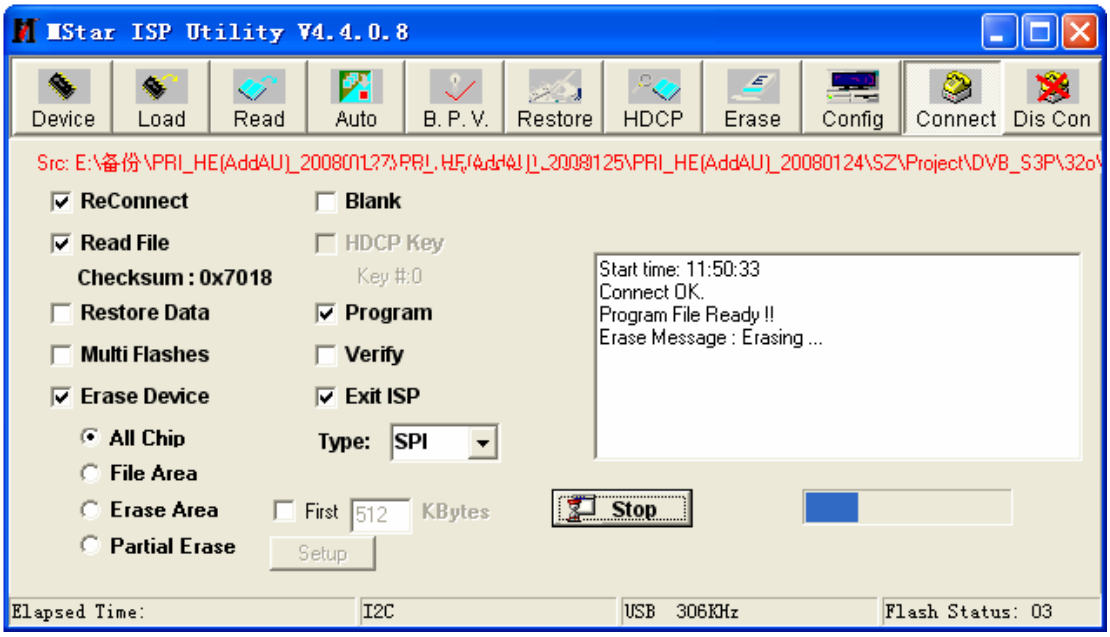


Fig6

If the process of “Erasing…” finishes soon and begins to “Programing”, that means Flash hasn’t been erased, please press “Stop” then press” Run”.

5. If the process of writing succeeds, it will display “Pass” near “Run”, otherwise, it is fault and needs writing again.

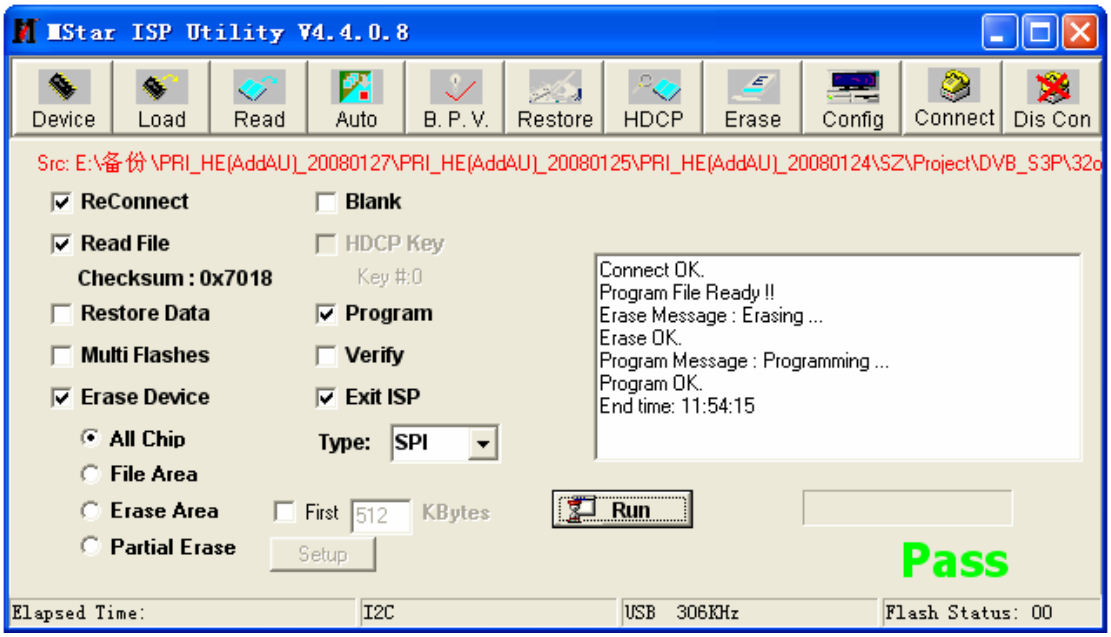


Fig7

Working principle analysis of the unit

1. PAL/SECAM signal flow:

Antenna reception PAL/SECAM signal will be send to tuner TDA1616, which contains frequency turning, HF and IF amplifier circuit and is controlled by master control IC MSD119 (comprises CPU) through I2C bus. The analog IF signal via intermediate frequency amplifying, video SAW filter K3953 and audio SAW filter K9656 to input to analog demodulate IC (IF) R2A10406NP, after demodulating and output standard video signal TV-CVBS and sound IF signal (SIF).

TV-CVBS will send to the master control IC MSD119 to video decode, deinterlace and scale, then output LVDS level drive for LCD panel.

The sound IF (SIF) will be fed into MSD119, after demodulating, pre-amplifying, bass adjusting and volume control, the sound signal will separate into L/R channels and input to operational amplifier AZ4558 amplifying, then output two ways. One way will be sent to earphone, another will be sent to class AB sound amplifier TDA7266SA amplifying then sent to speaker.

2. DVB-T signal flow:

Antenna reception DVB-T signal will be sent to tuner TDA1616, after frequency tuning, HF amplification, IF amplification and SAW FILTER, output IF signal to demodulation chip CE6353, via QAM demodulation, fed to MSD119 for information source decoding in the format of standard serial TS stream.

HD video signal via decoding to A/D conversion and OSD superposition, at last output LVDS drive level for panel display.

HD audio signal via decoder built-in MSD119, resumed to multi- channel sound of Dolby AC-3. The audio signal will be sent to back end to perform bass adjustment and volume control, then it will separate into L/R channels and input to operational amplifier AZ4558 amplifying, another way will be sent to class AB sound amplifier TDA7266SA amplifying then sent to speaker.

3. AV signal flow

AV signal will be fed to MSD119 to perform video decode, deinterlace and scale, then output LVDS drive level for panel display.

Audio signal from AV via matched resistance, is directly sent to MSD119 to bass adjust and volume control, the sound signal will separate into L/R channels and input to operational amplifier AZ4558 amplifying, then output two ways. One way will be sent to earphone, another will be sent to class AB sound amplifier TDA7266SA amplifying then sent to speaker.

4. PC/YPrPb signal flow

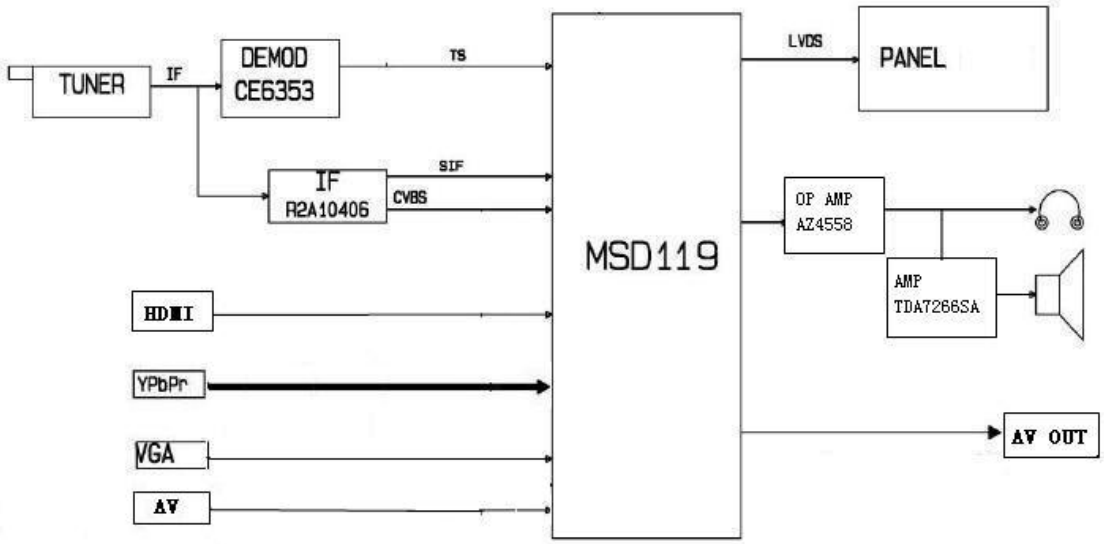
PC and YPbPr signal will be sent to MSD119 A/D conversion, output R/G/B of 24 bit to back end module to digital decode, image scale and OSD superposition, then send to LVDS level drive for panel display. Sound signal of PC/YPrPb via matched resistance and a-c couple to MSD119 to bass adjust and volume control, the sound signal will separate into L/R channels and input to operational amplifier AZ4558 amplifying, another will be sent to class AB sound amplifier TDA7266SA amplifying then sent to speaker.

5. HDMI signal flow

HDMI video signal is directly fed to the master control IC MSD119 to digital decode, image scale

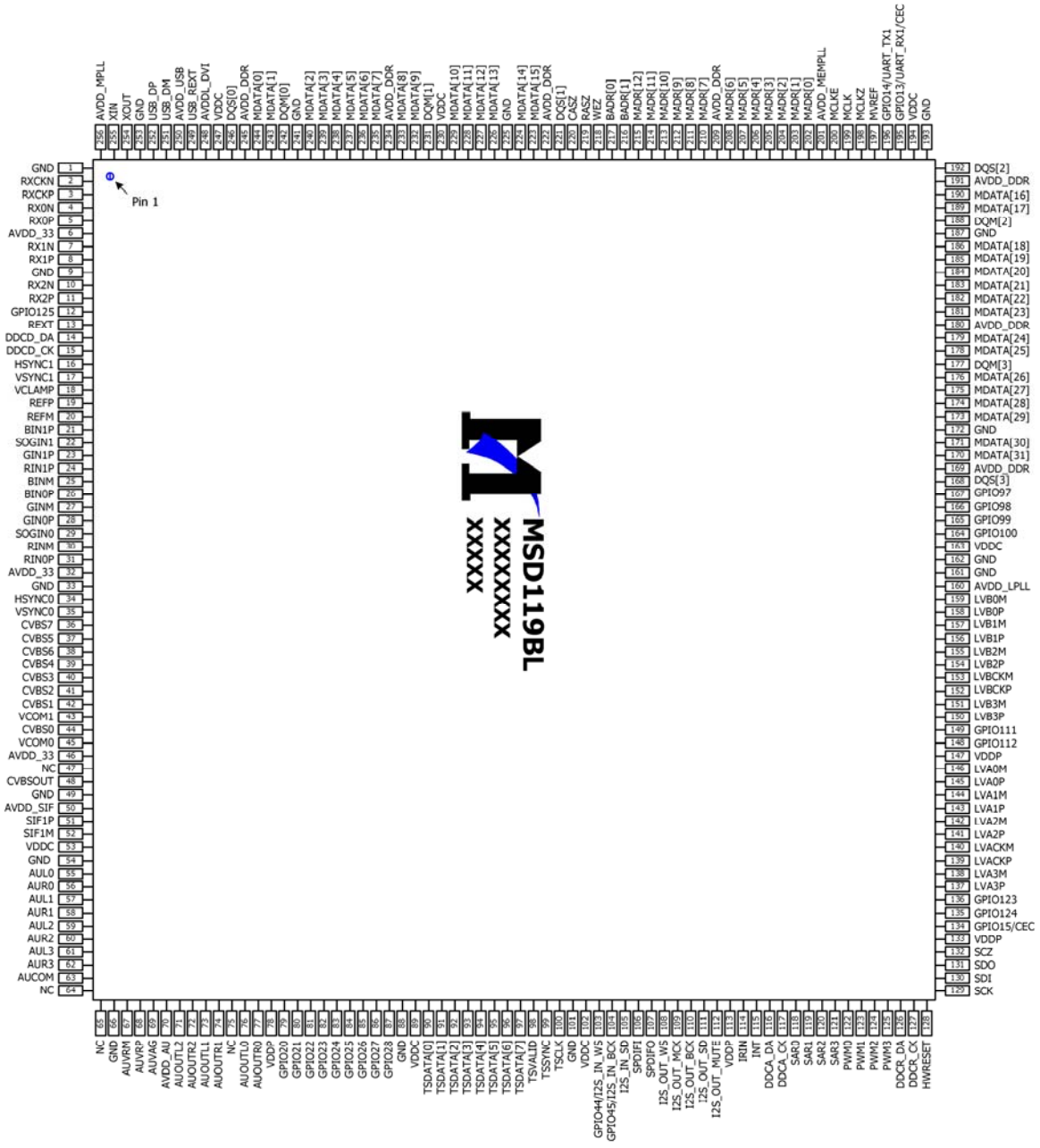
and OSD superposition, then output LVDS drive level for panel display. HDMI audio signal via decoder built-in MSD119 is fed to back end to bass adjust and volume control, the sound signal will separate into L/R channels and input to operational amplifier AZ4558 amplifying, another will be sent to class AB sound amplifier TDA7266SA amplifying then sent to speaker.

Block diagram



IC block diagram

1. MSD119CL-LF



PIN DESCRIPTION

Analog Interface

Pin Name	Pin Type	Function	Pin
VCLAMP		CVBS/YC Mode Clamp Voltage Bypass	18
REFP		Internal ADC Top De-coupling Pin	19
REFM		Internal ADC Bottom De-coupling Pin	20
REXT	Analog Input	External Resister 390 ohm to AVDD_33	13
BIN1P	Analog Input	Analog Blue Input from Channel 1	21
SOGIN1	Analog Input	Sync-On-Green input from Channel 1	22
GIN1P	Analog Input	Analog Green Input from Channel 1	23
RIN1P	Analog Input	Analog Red Input from Channel 1	24
BINM	Analog Input	Reference Ground for Analog Blue Input	25
BIN0P	Analog Input	Analog Blue Input from Channel 0	26
GINM	Analog Input	Reference Ground for Analog Green Input	27
GIN0P	Analog Input	Analog Green Input from Channel 0	28
SOGIN0	Analog Input	Sync-On-Green Input from Channel 0	29
RINM	Analog Input	Reference Ground for Analog Red Input	30
RIN0P	Analog Input	Analog Red Input from Channel 0	31
HSYNC1	Schmitt Trigger Input w/ 5V-tolerant	HSYNC / Composite Sync for VGA Input from channel 1	16
VSYNC1	Schmitt Trigger Input w/ 5V-tolerant	VSYNC for VGA Input from channel 1	17
HSYNC0	Schmitt Trigger Input w/ 5V-tolerant	HSYNC / Composite Sync for VGA Input from channel 0	34
VSYNC0	Schmitt Trigger Input w/ 5V-tolerant	VSYNC for VGA Input from channel 0	35

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Analog Video Input/Output Interface

Pin Name	Pin Type	Function	Pin
VCOM1	Analog Input	CVBS Video Input Reference Ground	43
VCOM0	Analog Input	CVBS Video Input Reference Ground	45
CVBS7	Analog Input	CVBS (Composite) Video Input Channel 7	36
CVBS5	Analog Input	CVBS (Composite) Video Input Channel 5	37
CVBS6	Analog Input	CVBS (Composite) Video Input Channel 6	38
CVBS4	Analog Input	CVBS (Composite) Video Input Channel 4	39
CVBS3	Analog Input	CVBS (Composite) Video Input Channel 3	40

Pin Name	Pin Type	Function	Pin
CVBS2	Analog Input	CVBS (Composite) Video Input Channel 2	41
CVBS1	Analog Input	CVBS (Composite) Video Input Channel 1	42
CVBS0	Analog Input	CVBS (Composite) Video Input Channel 0	44
CVBSOUT	Analog Output	CVBS (Composite) Video Output	48

Analog Audio Input/Output Interface

Pin Name	Pin Type	Function	Pin
SIF1P	Analog Input	SIF Audio Input Channel 1	51
SIF1M	Analog Input	Reference Ground for SIF Audio Input Channel 1	52
I2S_OUT_MCK	Output	Audio Master Clock Output	109
I2S_OUT_BCK	Output	Audio Bit Clock Output	110
I2S_OUT_WS	Output	Word Select Output; 4mA driving strength	108
I2S_OUT_SD	Output	Audio Serial Data Output; 4mA driving strength	111
I2S_OUT_MUTE	Output	Audio Output Mute Control	112
SPDIFO	Output	S/PDIF Audio Output; 4mA driving strength	107
I2S_IN_BCK	Input	Audio Bit Clock Input	100
I2S_IN_WS	Input	Word Select Input	99
I2S_IN_SD	Input	Audio Serial Data Input	105
SPDIFI	Input	S/PDIF Audio Input	106
AUVRM	Analog Output	Negative Reference Voltage for Audio ADC	67
AUVRP	Analog Output	Positive Reference Voltage for Audio ADC	68
AUVAG	Analog Output	Reference Voltage for Audio Common Mode	69
AUL0	Analog Input	Audio Line Input Left Channel 0	55
AUR0	Analog Input	Audio Line Input Right Channel 0	56
AUL1	Analog Input	Audio Line Input Left Channel 1	57
AUR1	Analog Input	Audio Line Input Right Channel 1	58
AUL2	Analog Input	Audio Line Input Left Channel 2	59
AUR2	Analog Input	Audio Line Input Right Channel 2	60
AUL3	Analog Input	Audio Line Input Left Channel 3	61
AUR3	Analog Input	Audio Line Input Right Channel 3	62
AUOUTL2	Analog Output	Main Audio Output Left Channel 2	71
AUOUTR2	Analog Output	Main Audio Output Right Channel 2	72
AUOUTL1	Analog Output	Main Audio Output Left Channel 1	73
AUOUTR1	Analog Output	Main Audio Output Right Channel 1	74
AUOUTL0	Analog Output	Main Audio Output Left Channel 0	76

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Pin Name	Pin Type	Function	Pin
AUOUTR0	Analog Output	Main Audio Output Right Channel 0	77
AUCOM	Analog Input	Reference Ground for Audio Line Input	63

TS Input Interface

Pin Name	Pin Type	Function	Pin
TSCLK	Input	TS Clock	100
TSDATA[7:0]	Input	TS Data in Parallel; LSB (bit 0) is for serial TS data	97-90
TSVALID	Input	TS Data Valid	98
TSSYNC	Input	TS Sync-Byte Indicator	99

DVI/HDMI Interface

Pin Name	Pin Type	Function	Pin
RX0N	Input	DVI/HDMI Channel 0 Negative Data Input	4
RX0P	Input	DVI/HDMI Channel 0 Positive Data Input	5
RX1N	Input	DVI/HDMI Channel 1 Negative Data Input	7
RX1P	Input	DVI/HDMI Channel 1 Positive Data Input	8
RX2N	Input	DVI/HDMI Channel 2 Negative Data Input	10
RX2P	Input	DVI/HDMI Channel 2 Positive Data Input	11
RXCKN	Input	DVI/HDMI Negative Clock Input	2
RXCKP	Input	DVI/HDMI Positive Clock Input	3

LVDS Interface

Pin Name	Pin Type	Function	Pin
LVA0M	Output	LVDS A-Link Channel 0 Negative Data Output	146
LVA0P	Output	LVDS A-Link Channel 0 Positive Data Output	145
LVA1M	Output	LVDS A-Link Channel 1 Negative Data Output	144
LVA1P	Output	LVDS A-Link Channel 1 Positive Data Output	143
LVA2M	Output	LVDS A-Link Channel 2 Negative Data Output	142
LVA2P	Output	LVDS A-Link Channel 2 Positive Data Output	141
LVACKM	Output	LVDS A-Link Negative Clock Output	140
LVACKP	Output	LVDS A-Link Positive Clock Output	139
LVA3M	Output	LVDS A-Link Channel 3 Negative Data Output	138
LVA3P	Output	LVDS A-Link Channel 3 Positive Data Output	137
LVB0M	Output	LVDS B-Link Channel 0 Negative Data Output	159
LVB0P	Output	LVDS B-Link Channel 0 Positive Data Output	158

Pin Name	Pin Type	Function	Pin
LVB1M	Output	LVDS B-Link Channel 1 Negative Data Output	157
LVB1P	Output	LVDS B-Link Channel 1 Positive Data Output	156
LVB2M	Output	LVDS B-Link Channel 2 Negative Data Output	155
LVB2P	Output	LVDS B-Link Channel 2 Positive Data Output	154
LVBCKM	Output	LVDS B-Link Negative Clock Output	153
LVBCKP	Output	LVDS B-Link Positive Clock Output	152
LVB3M	Output	LVDS B-Link Channel 3 Negative Data Output	151
LVB3P	Output	LVDS B-Link Channel 3 Positive Data Output	150

Serial Flash Interface

Pin Name	Pin Type	Function	Pin
SCK	Output	SPI Flash Serial Clock	129
SDI	Output	SPI Flash Serial Data Input	130
SDO	Input w/ 5V-tolerant	SPI Flash Serial Data Output	131
SCZ	Output	SPI Flash Chip Select	132
IRIN	Input w/5V-tolerant	IR Receiver Input	114
INT	Input	MCU Bus Interrupt; 4mA driving strength	115

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GPIO Interface

Pin Name	Pin Type	Function	Pin
GPIO125	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	12
GPIO124	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	135
GPIO123	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	136
GPIO112	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	148
GPIO111	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	149
GPIO100	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	164
GPIO99	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	165
GPIO98	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	166
GPIO97	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	167
GPIO66	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	110
GPIO65	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	111
GPIO64	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	112
GPIO63	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	113
GPIO45/ I2S_IN_BCK	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength / Audio Bit Clock Input	104

Pin Name	Pin Type	Function	Pin
GPIO44/ I2S_IN_WS	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength / Word Select Output; 4mA driving strength	103
GPIO28	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	87
GPIO27	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	86
GPIO26	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	85
GPIO25	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	84
GPIO24	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	83
GPIO23	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	82
GPIO22	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	81
GPIO21	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	80
GPIO20	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength	79
GPIO15/ CEC	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength / Consumer Electronics Control	134
GPIO14/ UART_TX1	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength / Universal Asynchronous Transmitter	196
GPIO13/ UART_RX1/ CEC	I/O w/ 5V-tolerant	General Purpose Input/Output; 4mA driving strength / Universal Asynchronous Receiver / Consumer Electronics Control	195
PWM3	Output	Pulse Width Modulation Output; 4mA driving strength	125
PWM2	Output	Pulse Width Modulation Output; 4mA driving strength	124
PWM1	Output	Pulse Width Modulation Output; 4mA driving strength	123
PWM0	Output	Pulse Width Modulation Output; 4mA driving strength	122
SAR3	Analog Input	SAR Low Speed ADC Input 3; General Purpose Input/Output	121
SAR2	Analog Input	SAR Low Speed ADC Input 2; General Purpose Input/Output	120
SAR1	Analog Input	SAR Low Speed ADC Input 1; General Purpose Input/Output	119
SAR0	Analog Input	SAR Low Speed ADC Input 0; General Purpose Input/Output	118

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DRAM Interface

Pin Name	Pin Type	Function	Pin
DQM[3:0]	Output	Data Mask for Low Byte; active high	177, 188, 231, 242
DQS[3:0]	I/O	Data Strobe	168, 192, 221, 246
MVREF	Input	Reference Voltage for DDR SDRAM Interface	197
MCLKZ	Output	DRAM Memory Negative Differential Clock	198

Pin Name	Pin Type	Function	Pin
MCLK	Output	DRAM Memory Positive Differential Clock	199
MCLKE	Output	DRAM Memory Clock Enable	200
BADR[1:0]	Output	DRAM Memory Bank Address	216, 217
WEZ	Output	Write Enable; active low	218
RASZ	Output	Row Address Strobe; active low	219
CASZ	Output	Column Address Strobe; active low	220
MDATA[31:0]	I/O	DRAM Memory Data Bus	170, 171, 173-176, 178, 179, 181-186, 189, 190, 223, 224, 226-229, 232, 233, 235-240, 243, 244
MADR[12:0]	Output	DRAM Memory Address	215-210, 208-202

USB Interface

Pin Name	Pin Type	Function	Pin
USB_REXT		USB External Resistor Pin; Connected through 900 ohm (±1%) Resistor to GND (Pin #253)	249
USB_DM	Analog I/O	USB Inverting Data Input/Output	251
USB_DP	Analog I/O	USB Non Inverting Data Input/Output	252

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Misc. Interface

Pin Name	Pin Type	Function	Pin
DDCD_DA	I/O w/ 5V-tolerant	HDCP Serial Bus Data / DDC Data of DVI/HDMI Port	14
DDCD_CK	Input w/ 5V-tolerant	HDCP Serial Bus Clock / DDC Clock of DVI/HDMI Port	15
DDCA_DA	I/O w/ 5V-tolerant	DDC Data for Analog Port	116
DDCA_CK	I/O w/ 5V-tolerant	DDC Clock for Analog Port	117
HWRESET	Schmitt Trigger Input w/ 5V-tolerant	Hardware Reset; active high	128
DDCR_DA	I/O w/ 5V-tolerant	DDC Data for ROM	126
DDCR_CK	I/O w/ 5V-tolerant	DDC Clock for ROM	127
XIN	Analog Input	Crystal Oscillator Input	255
XOUT	Analog Output	Crystal Oscillator Output	254

Power Pins

Pin Name	Pin Type	Function	Pin
AVDD_SIF	3.3V Power	SIF Power	50
AVDD_AU	3.3V Power	Audio Power	70
AVDD_DDR	2.5V Power	DDR Power	169, 180, 191, 209, 222, 234, 245
AVDD_LPLL	3.3V Power	LPLL Power	160
AVDD_MPLL	3.3V Power	MPLL Power	256
AVDD_MEMPLL	3.3V Power	PLL Power	201
AVDD_33	3.3V Power	ADC Power	6, 32, 46
AVDDL_DVI	1.2V Power	DVI Power	248
AVDD_USB	3.3V Power	USB Power	250
VDDC	1.2V Power	Digital Core Power	53, 89, 102, 163, 194, 230, 247
VDDP	3.3V Power	Digital Input/Output Power	78, 113, 133, 147
GND	Ground	Ground	1, 9, 33, 49, 54, 66, 88, 101, 161, 162, 172, 187, 193, 225, 241, 253

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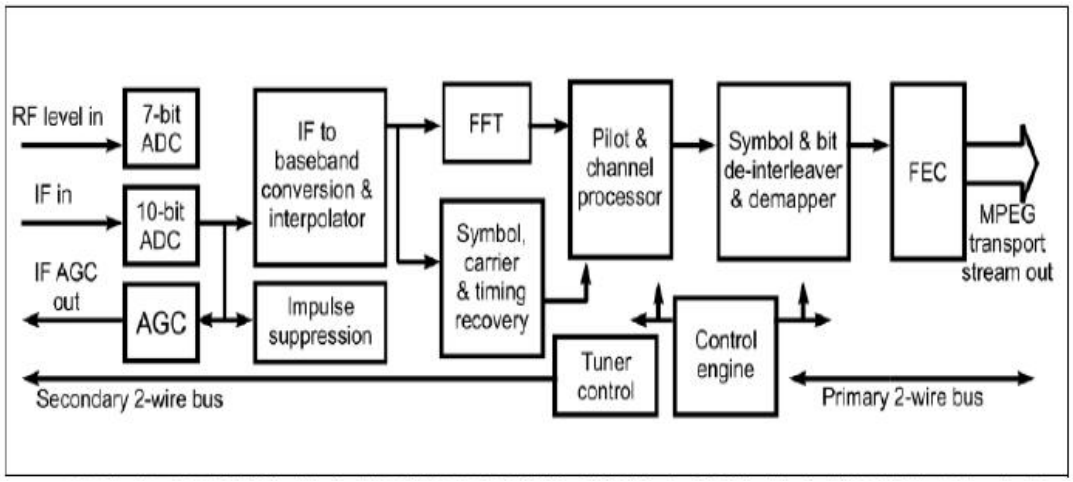
No Connects

Pin Name	Pin Type	Function	Pin
NC		No connect.	47, 64, 65, 75

Twin-turbo 8051 MCU
Supports multi-path TS stream input
Two paths TS stream output, integrated switch selection
Supports both serial and parallel TS stream input
Maximum TS data rate is 104Mbps for serial or 13MB/sec for parallel
MPEG-2 audio decoder
MPEG-1, MPEG-2 (Layer I/II) and Dolby1 Digital(AC-3) audio decoder
NTSC/PAL/SECAM video decoder
Supports NTSC-M, NTSC-J, NTSC-4.43, PAL (B,D,G,H,M,N,I,), and SECAM
Multi-standard sound processor
Supports BTSC/A2/EIA-J demodulation in NTSC and A2/NICAM/FM/AM demodulation in PAL
Supports MTS Mode MONO/STEREO/SAP in BTSC/EIA-J and MONO/STEREO/DUAL in A2/NICAM
Digital Audio Interface
Analog RGB Compliant/YUV input Ports
Two analog ports support up to 1080P
Supports PC RGB input up to SXGA@75Hz
Supports HDTV RGB/YPbPr/YCbCr
Supports Composite Sync and SOG (Sync-on-Green) separator
Automatic color calibration
DVI/HDCP/HDMI input ports
Supports up to 225MHz @ 1080P 60Hz with 12-bit deep-color resolution
High-bandwidth Digital Content Protection (HDCP) 1.1 compliant receiver

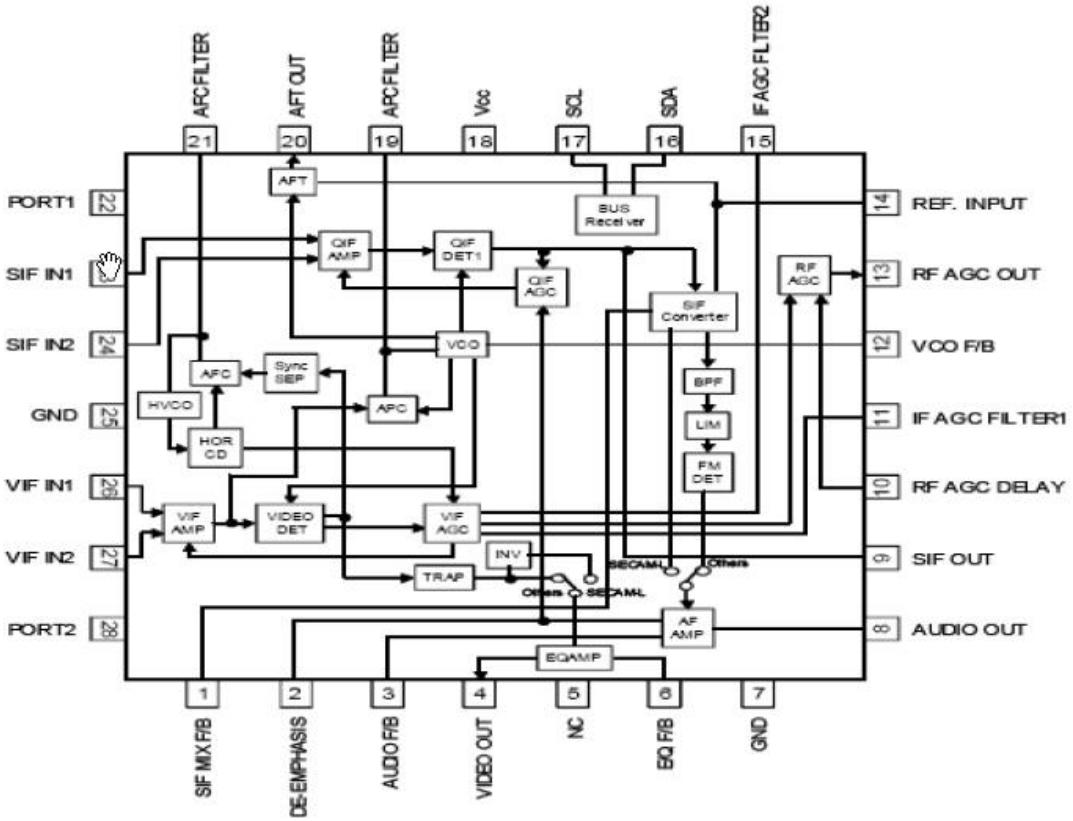
High Definition Multimedia Interface (HDMI) 1.3 compliant receiver with CEC (Consumer Electronics Control) support
Video Processing & Conversion
3-D motion adaptive video de-interlacers with edge-oriented adaptive algorithm for smooth low-angle edges
Automatic 3:2 pull-down & 2:2 pull-down detection and recovery
10-bit internal data processing
3-D video noise reduction
Output Interface
Supports up to 10-bit dual LVDS full-HD (1920 x 1080) panel interface
Video output port
Supports CVBS/S-video bypass output
Built-in video encoder for encoding digital video into CVBS output
Miscellaneous
USB 2.0 port can be connected to the external equipment for software upgrading

2. CE6353



The chip comprises 8MHz bandwidth SAW and supports demodulation of 6MHz, 7MHz and 8MHz, 2K/8K carrier and supports both serial and parallel TS stream output.

3. R2A10406NP



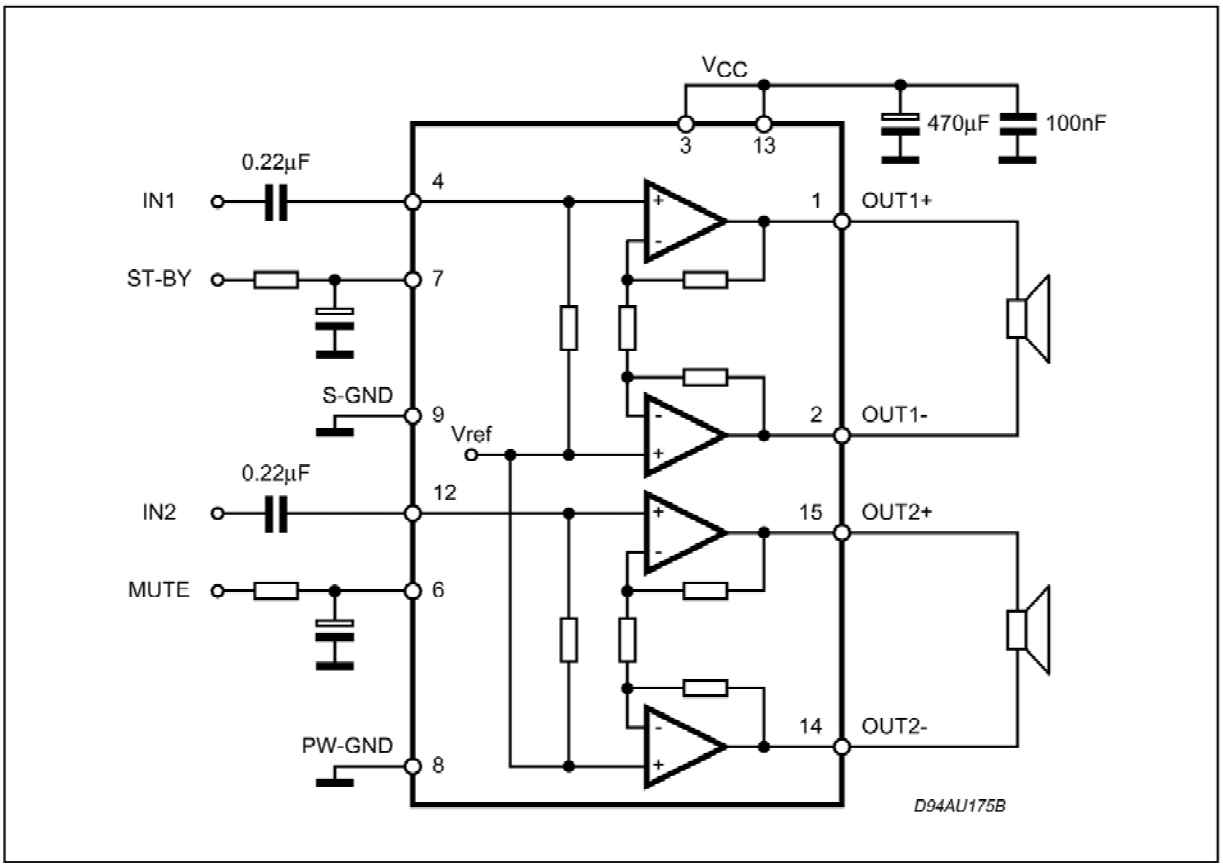
*VIF frequency corresponds to 38.9MHz.

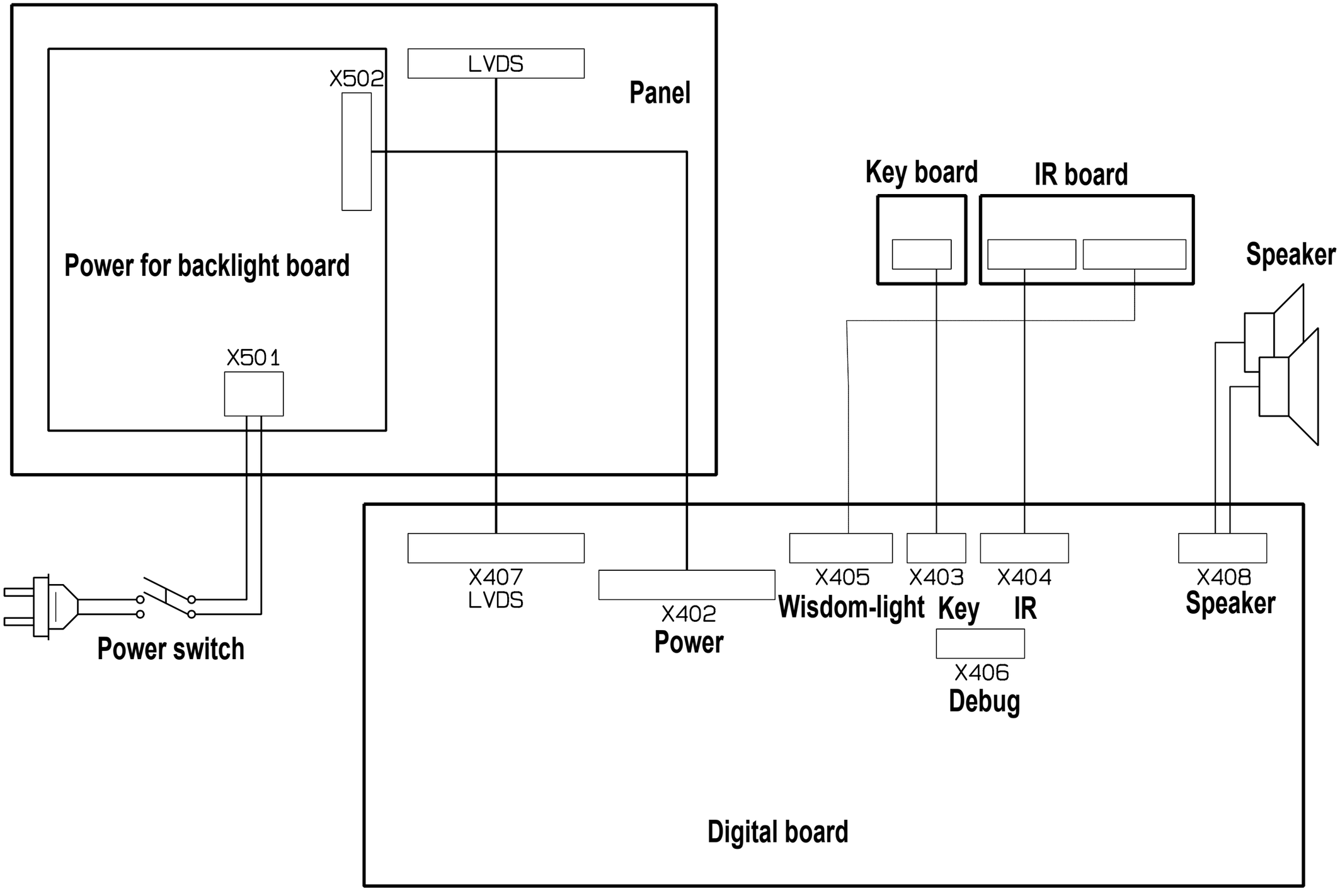
*SIF frequency corresponds to M/N,B/G,I,D/K and SECAM L,L'.

*I2CBUS control.

4. TDA7266SA

The TDA7266SA is a dual bridge amplifier.


VCC
3
13
470µF
100nF
0.22µF
IN1
4
1
OUT1+
ST-BY
7
S-GND
9
Vref
2
OUT1-
0.22µF
IN2
12
15
OUT2+
MUTE
6
PW-GND
8
14
OUT2-
D94AU175B



Wiring diagram

Trouble shooting

1. Fault clearance

Before servicing please check to find the possible causes of the troubles according to the table below.

1.1 Antenna (signal):

Picture is out of focus or jumping	● Bad status in signal receiving ● Poor signal ● Check if there are failures with the electrical connector or the antenna. ● Check if the antenna is properly connected.
Fringe in picture	● Check if the antenna is correctly oriented. ● Maybe there is electric wave reflected from hilltop or building.
Picture is interfered by stripe shaped bright spots	● Possibly due to interference from automobile, train, high voltage transmission line, neon lamp etc. ● Maybe there is interference between antenna and power supply line. Please try to separate them in a longer distance. ● Maybe the shielded-layer of signal wire is not connected properly to the connector.
There appear streaks or light color on the screen	● Check if interfered by other equipment and if interfered possibly by the equipment like transmitting antenna, non-professional radio station and cellular phone.

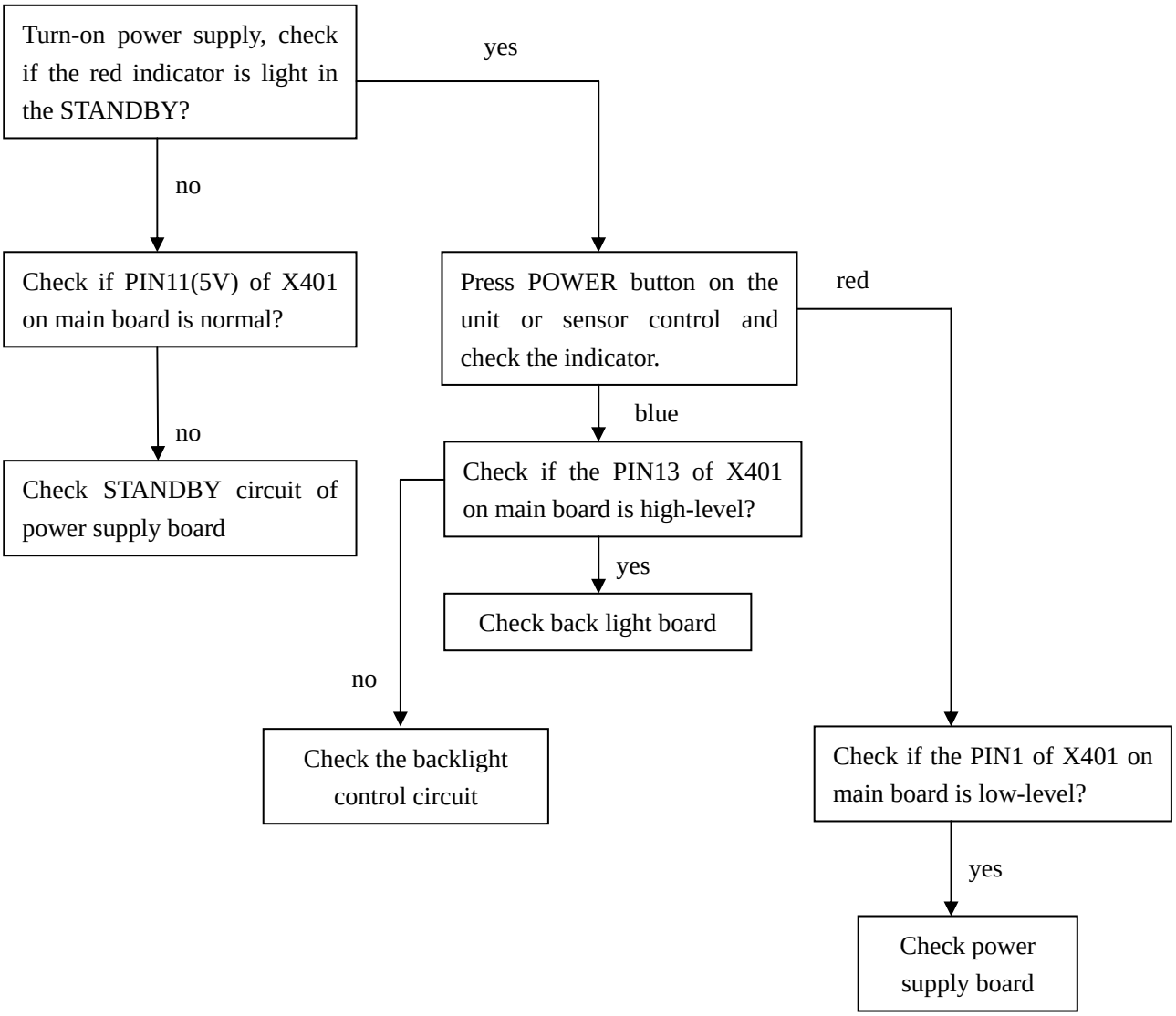
1.2 TV set:

Symptoms	Possible cause
Unable to switch the power on	● Check to see if the power plug has been inserted properly into the socket.
No picture and sound	● Check to see if the power supply of liquid crystal TV has been switched on. (As can be indicated by the red LED at the front of the TV set) ● See if it's receiving the signal that is transmitted from other source than the station ● Check if it's connected to the wrong terminal or if the input mode is correct. ● Check if the signal cable connection between video frequency source and the liquid crystal TV set is correct.
Deterioration of color phase or color tone	● Check if all the picture setups have been corrected.
Screen position or size is not proper	● Check is the screen position and size is correctly set up.
Picture is twisted and deformed	● Check to see if the picture-frame ratio is properly set up.
Picture color changed or colorless	● Check the "Component" or "RGB" settings of the liquid

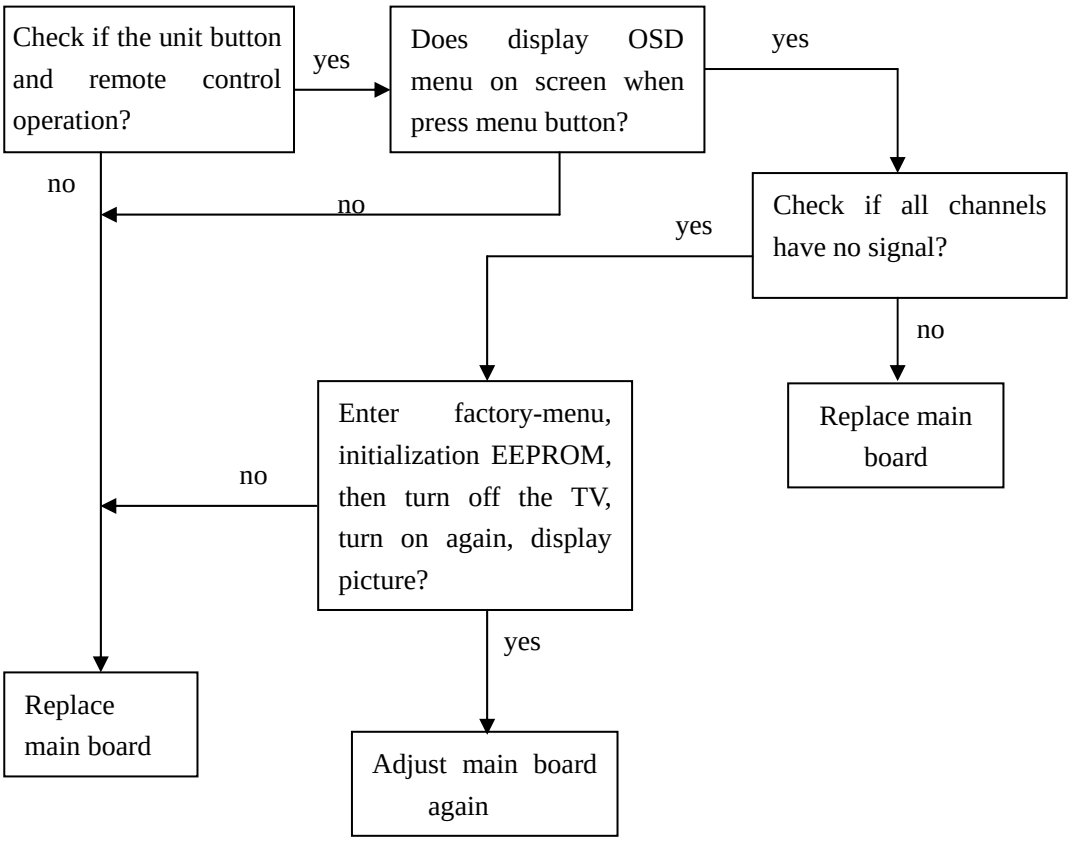
	crystal TV set and make proper adjustment according to the signal types.
Picture too bright and there is distortion in the brightest area	● Check if the contrast setting is too high. ● Possibly the output quality of DVD broadcaster is set too high. ● It maybe also due to improper terminal connection of the video frequency signal in a certain position of the system.
Picture is whitish or too bright in the darkest area of the picture	● Check if the setting for the brightness is too high ● Possibly the brightness grade of DVD player (broadcaster) is set too high.
No picture or signal produced from the displayer if “XXX in search” appears.	● Check if the cable is disconnected. ● Check if it’s connected to the proper terminal or if the input mode is correct.
There appears an indication - “outside the receivable scope)	● Check if the TV set can receive input signal. The signal is not correctly identified and VGA format is beyond the specified scope.
Remote control cannot work properly	● Check if the batteries are installed in the reverse order. ● Check if the battery is effective. ● Check the distance or angle from the monitor. ● Check if there is any obstruct between the remote control and the TV set. ● Check if the remote control signal- receiving window is exposed to strong fluorescence.
No picture and sound, but only hash.	● Check if the antenna cable is correctly connected, or if it has received the video signal correctly.
Blur picture	● Check if the antenna cable is correctly connected. ● Of if it has received the right video signal.
No sound	● Check if the “mute” audio frequency setting is selected. ● Check if the sound volume is set to minimum. ● Make sure the earphone is not connected. ● Check if the cable connection is loose.
When playing VHS picture search tape, there are lines at the top or bottom of the picture.	● When being played or in pause VHS picture search tape sometimes can’t provide stable picture, which may lead to incorrect display of the liquid crystal TV, In this case please press “auto” key on the remote control so as to enable the liquid crystal TV set to recheck the signal and then to display correct picture signal

2. Troubleshooting guide

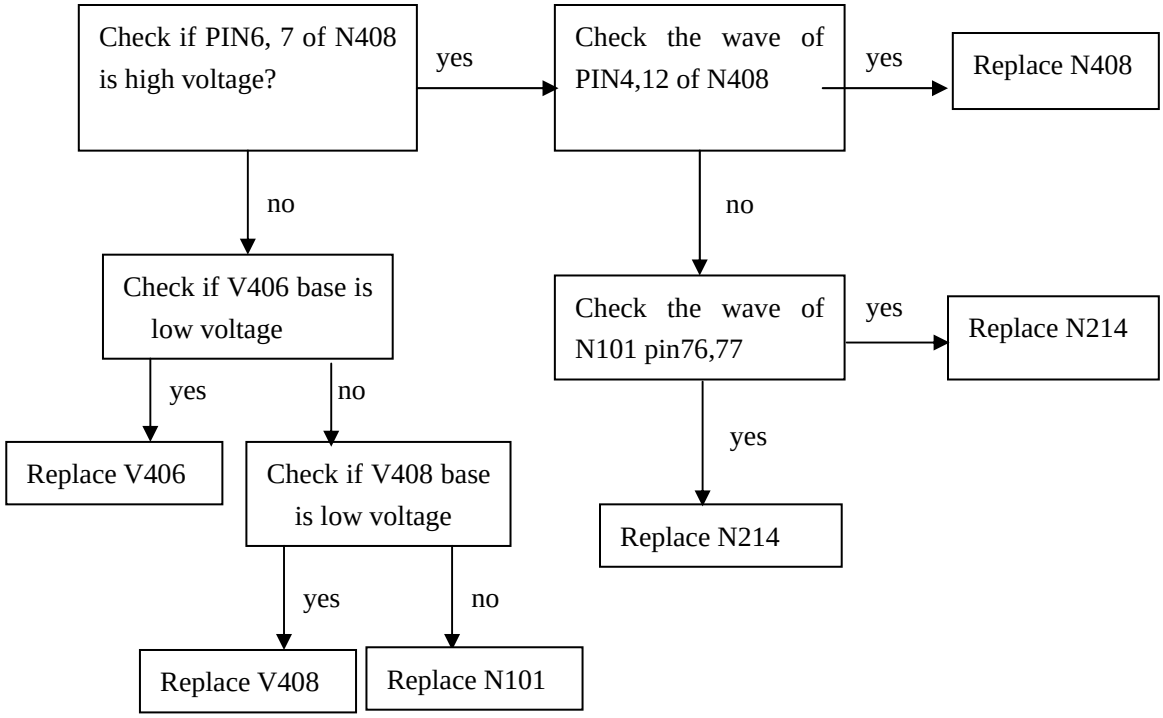
2.1. No raster


Turn-on power supply, check if the red indicator is light in the STANDBY?
yes
no
Check if PIN11(5V) of X401 on main board is normal?
no
Check STANDBY circuit of power supply board
Press POWER button on the unit or sensor control and check the indicator.
red
blue
Check if the PIN13 of X401 on main board is high-level?
yes
Check back light board
no
Check the backlight control circuit
Check if the PIN1 of X401 on main board is low-level?
yes
Check power supply board

2.2. Backlight, but no picture



2.3 Picture, but no sound



N101
MSD119CL

N105
HY5DU561622FTP-4

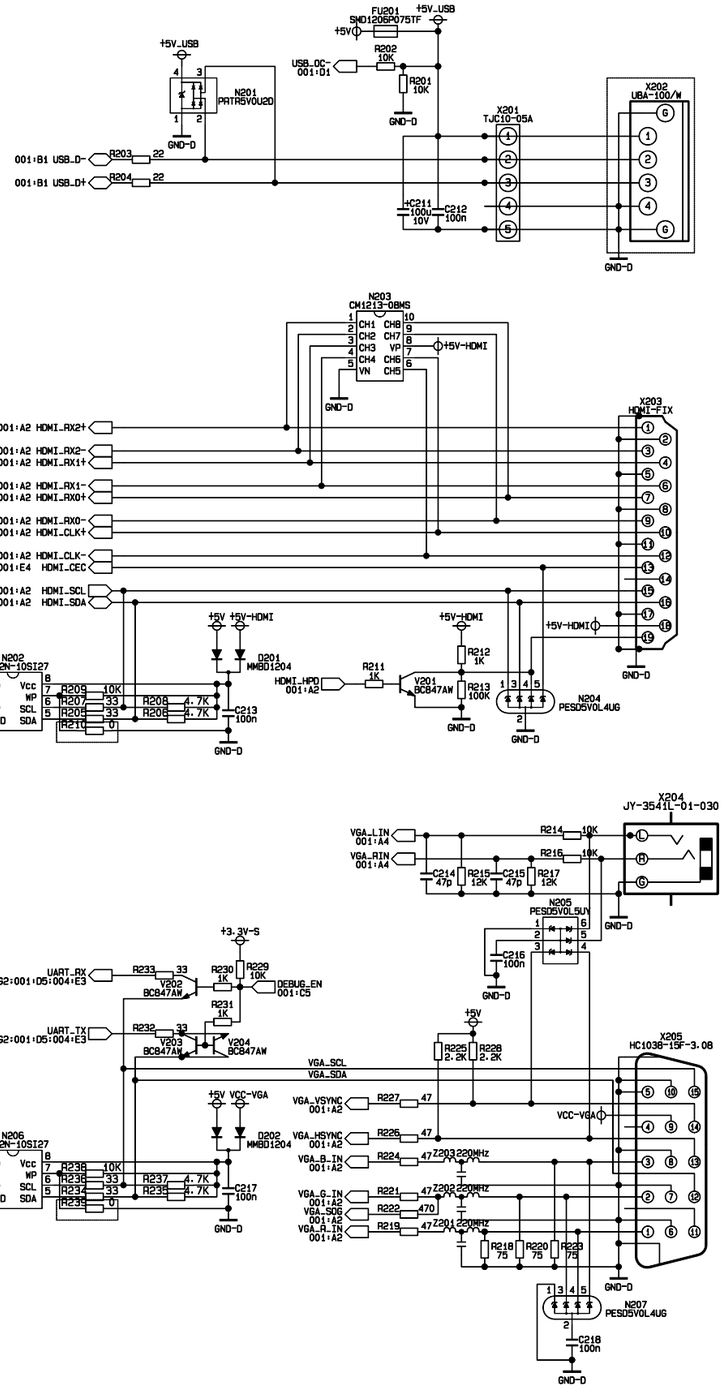
N106
HY5DU561622FTP-4

N102
MX25L3205DM2C-12G

N103
AT24LC32A/SN

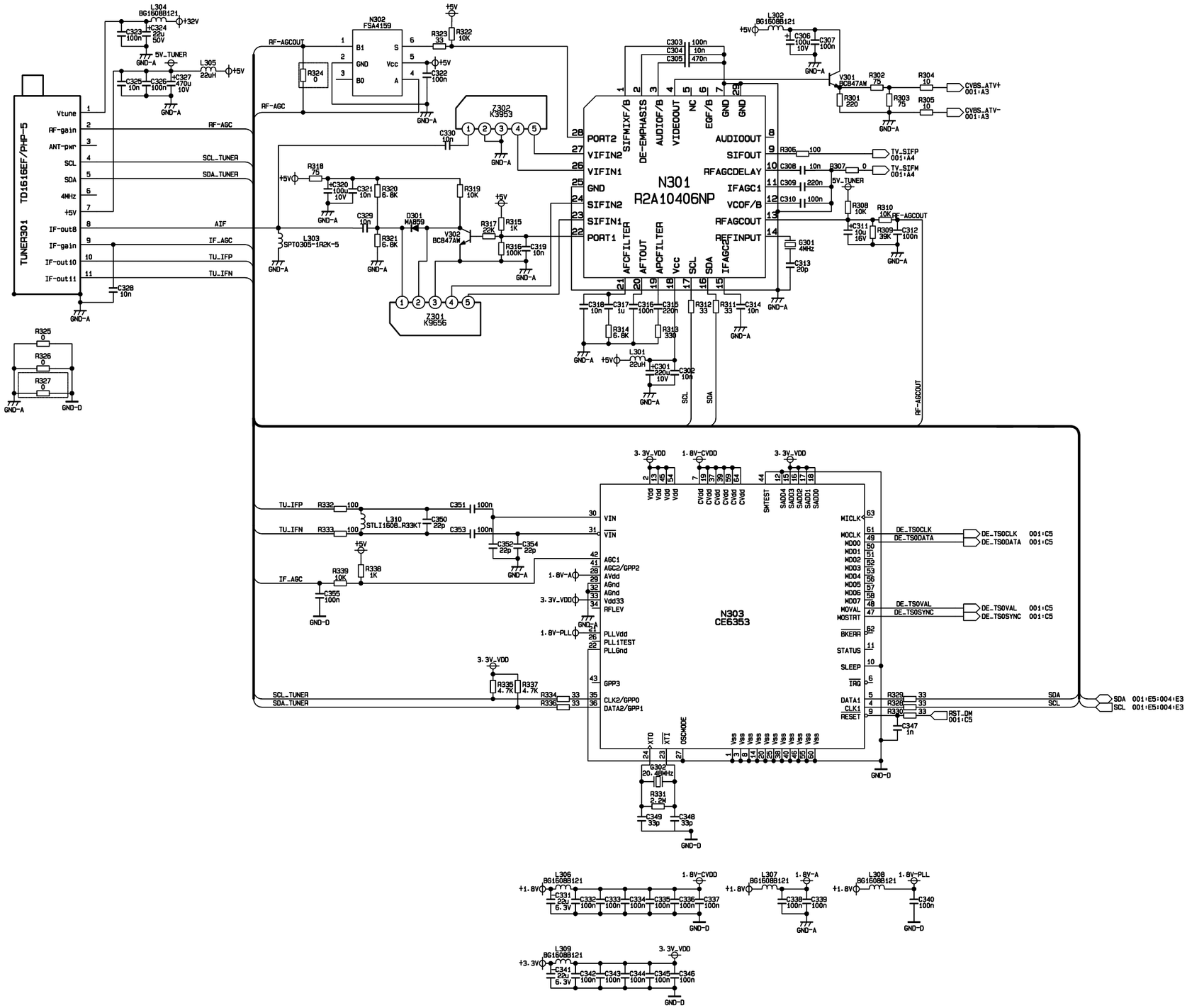
N104
AT24C04N-10SI-2.7

9219HE4001DL
9219HE4201DL
9226HE4001DL
main chip & memory 1/11



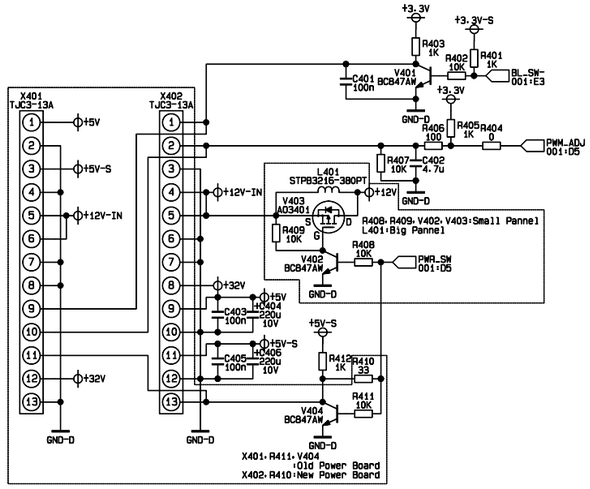
9219HE4001DL
9219HE4201DL
9226HE4001DL

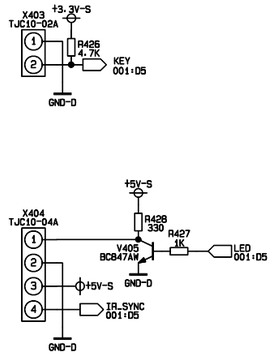
video & audio interface 2/11

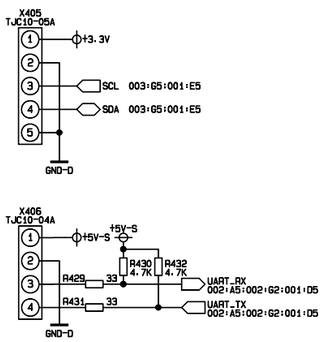


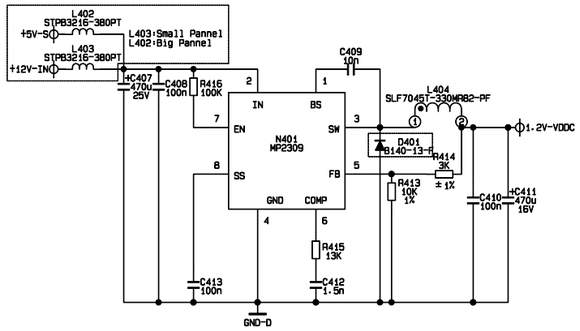
9219HE4001DL
9219HE4201DL
9226HE4001DL

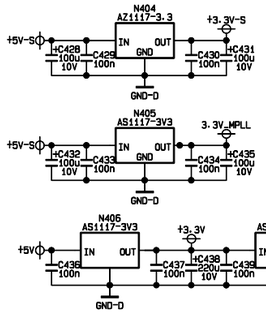
RF receiving 3/11

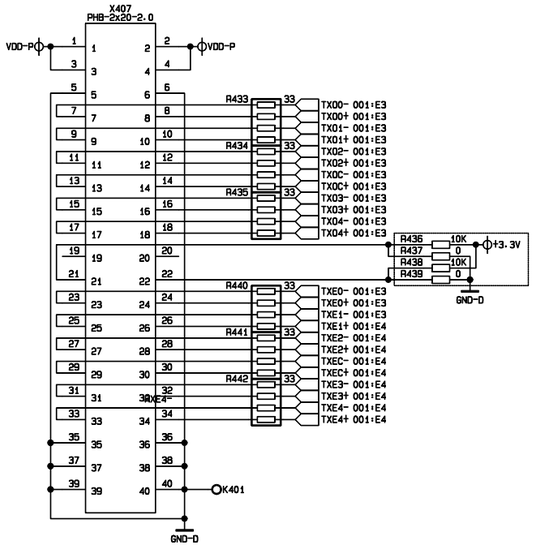


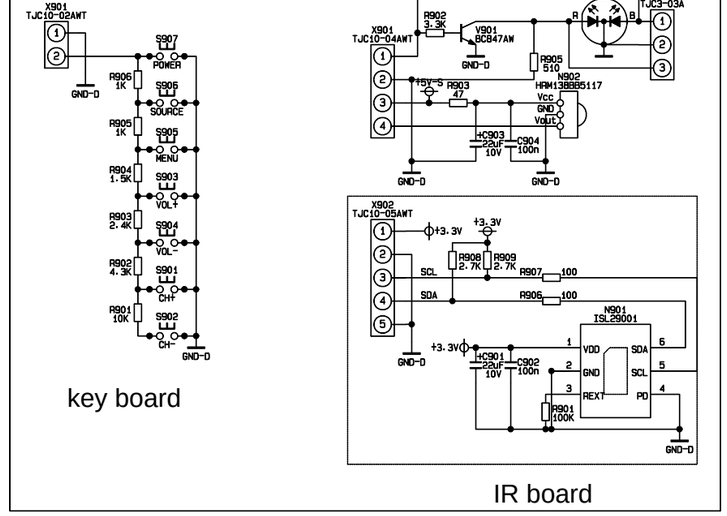


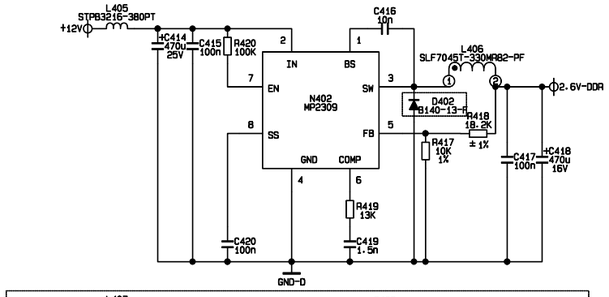


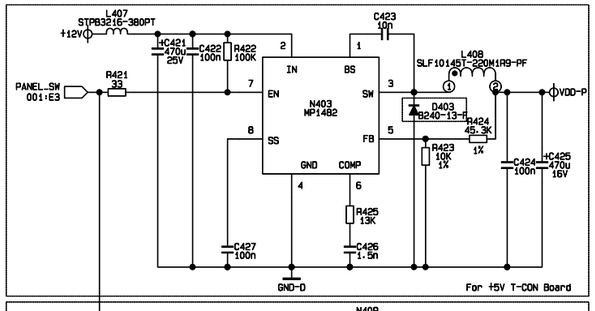


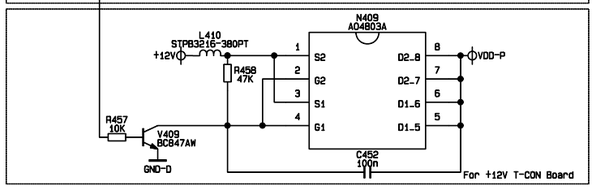


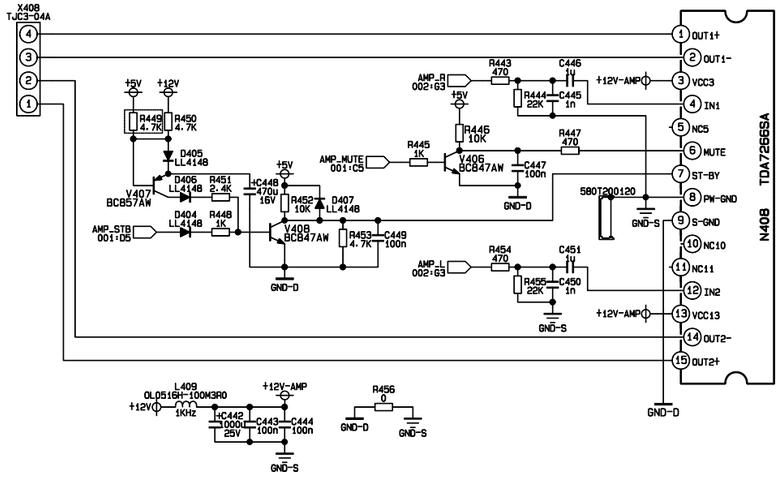






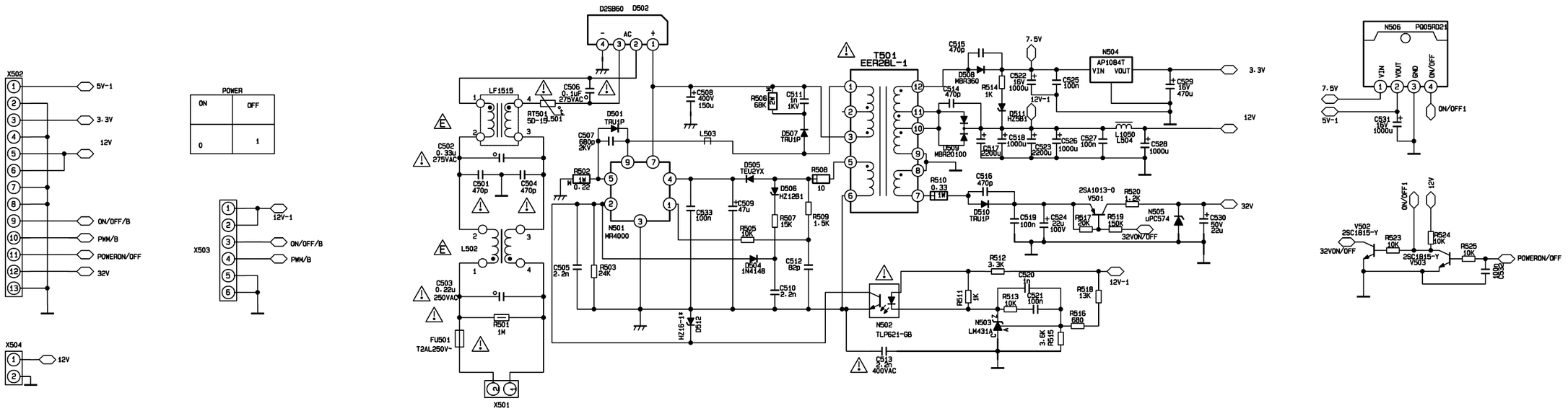






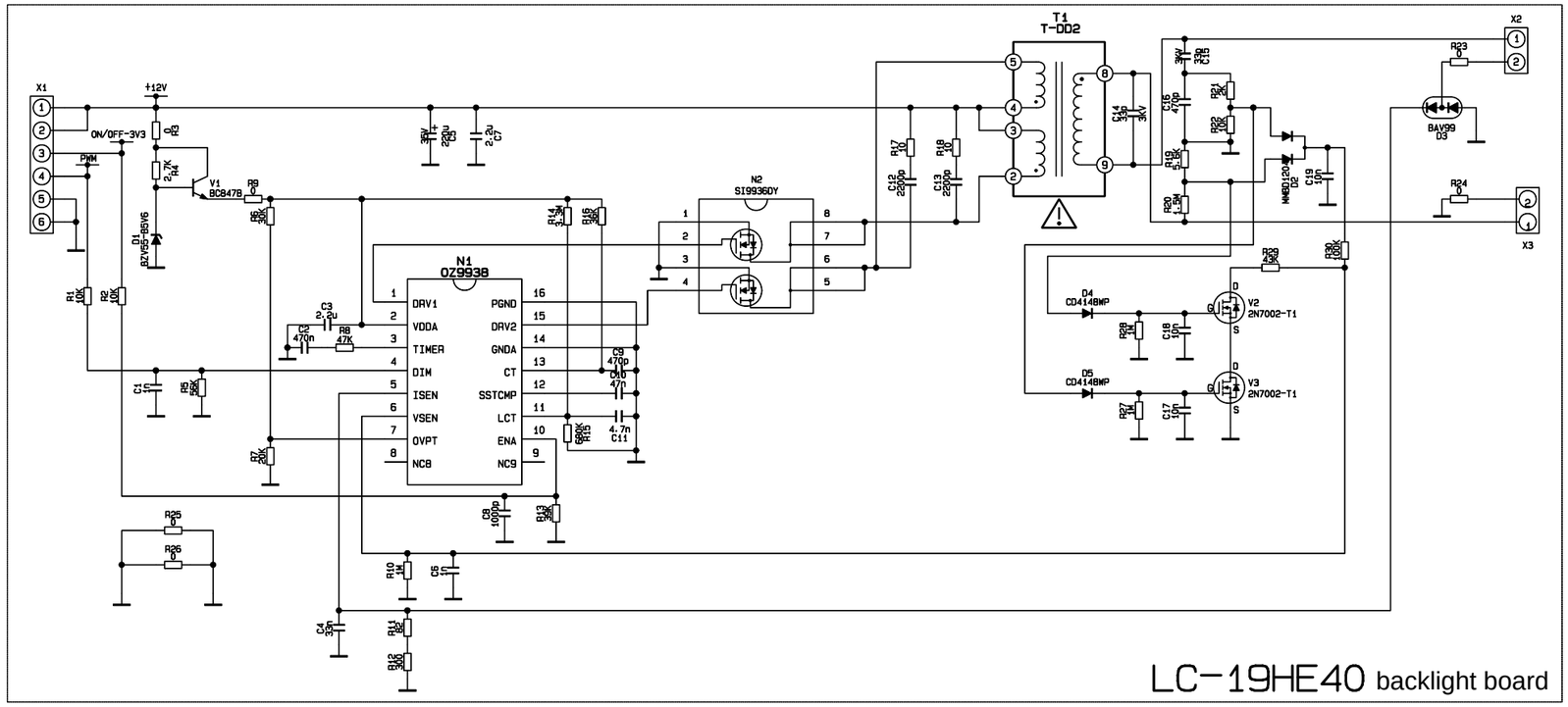
9219HE4001DL
9219HE4201DL
9226HE4001DL

non-video & audio interface 4/11

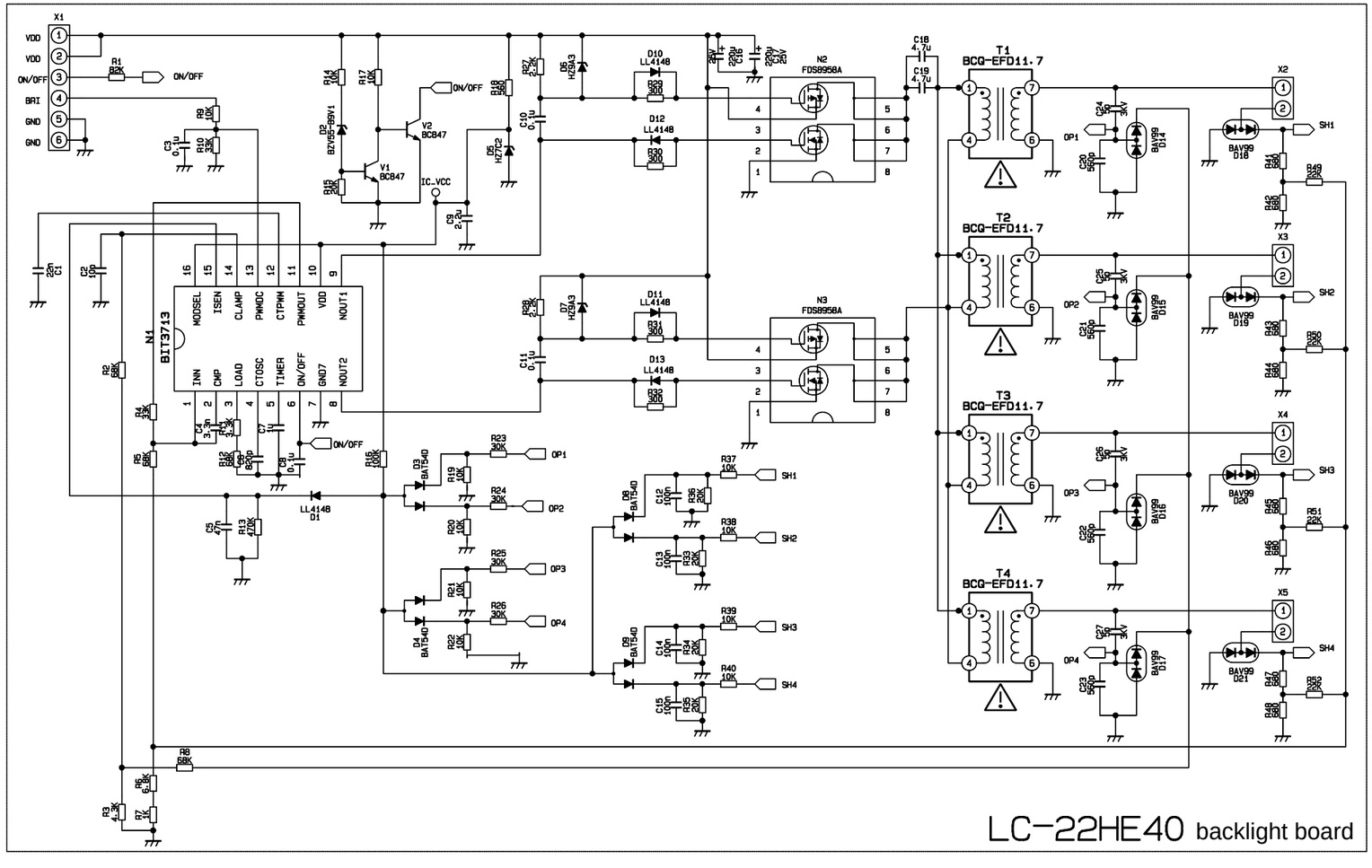


9219HE4001DL
9219HE4201DL
9226HE4001DL

power board 5/11



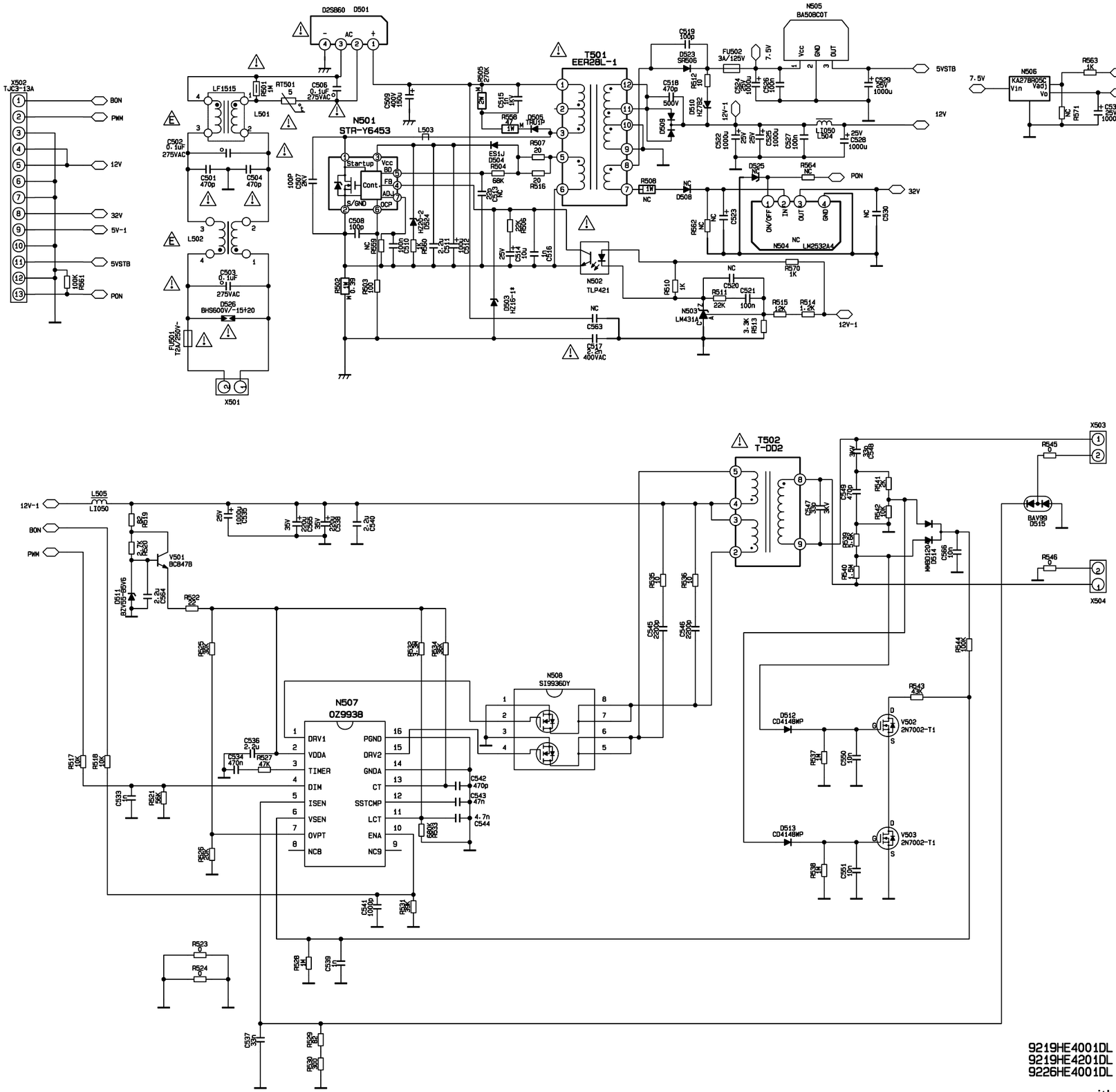
LC-19HE40 backlight board



LC-22HE40 backlight board

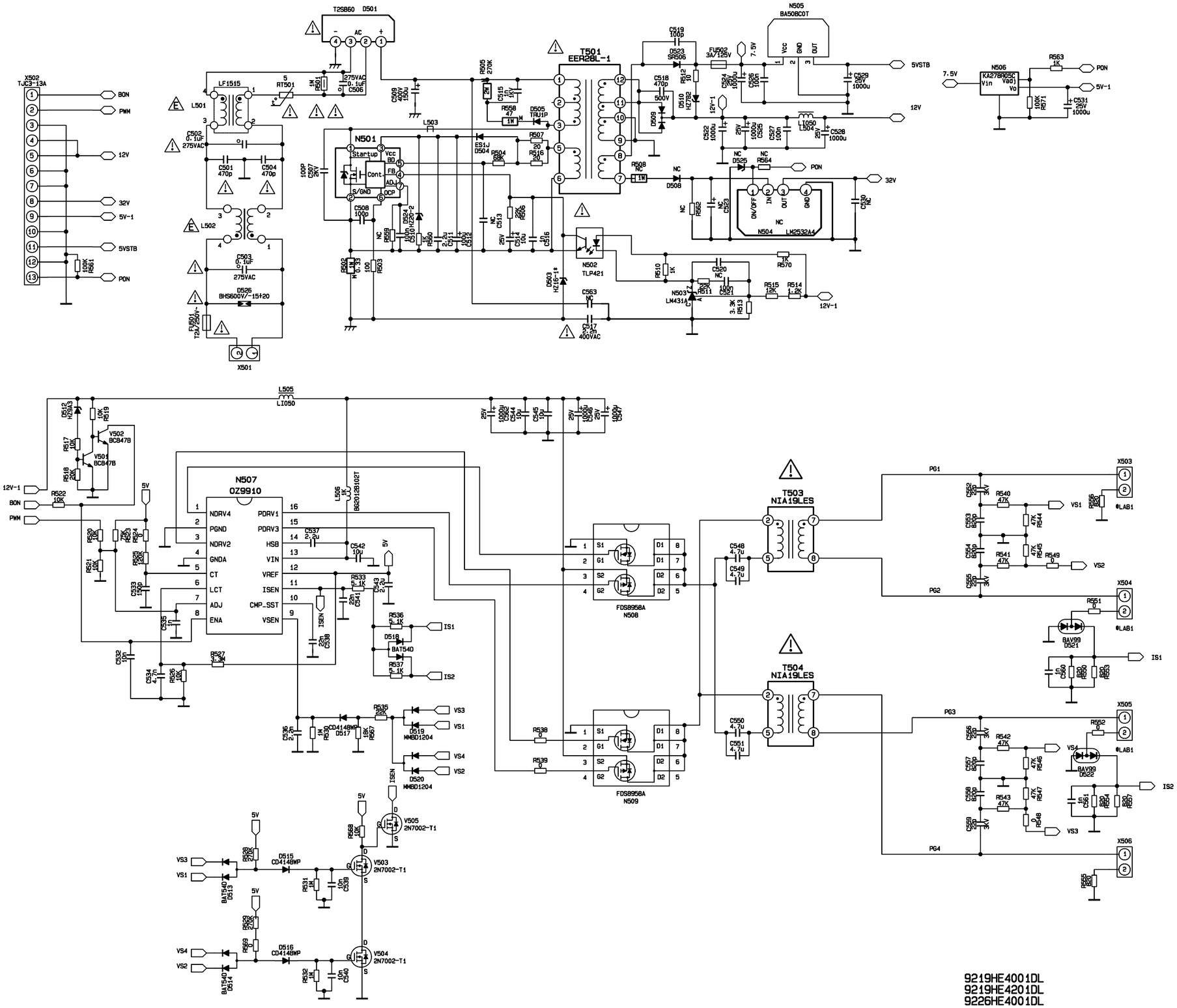
9219HE4001DL
9219HE4201DL
9226HE4001DL

backlight board 6/11



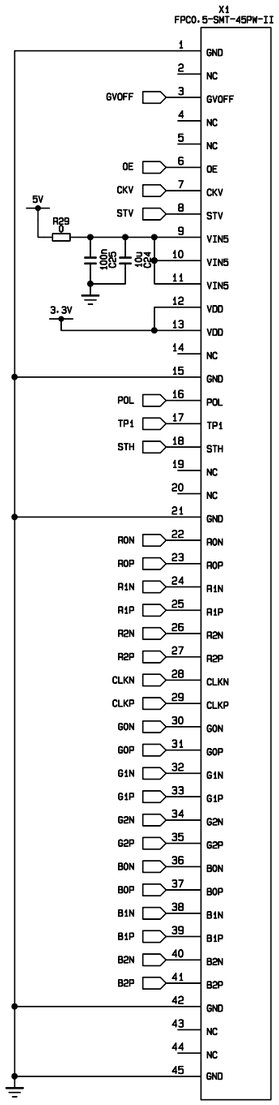
9219HE4001DL
9219HE4201DL
9226HE4001DL

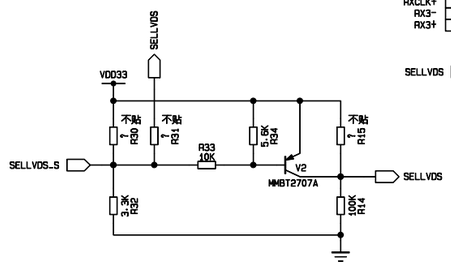
power with dual-lamp-tube for backlight board 7/11

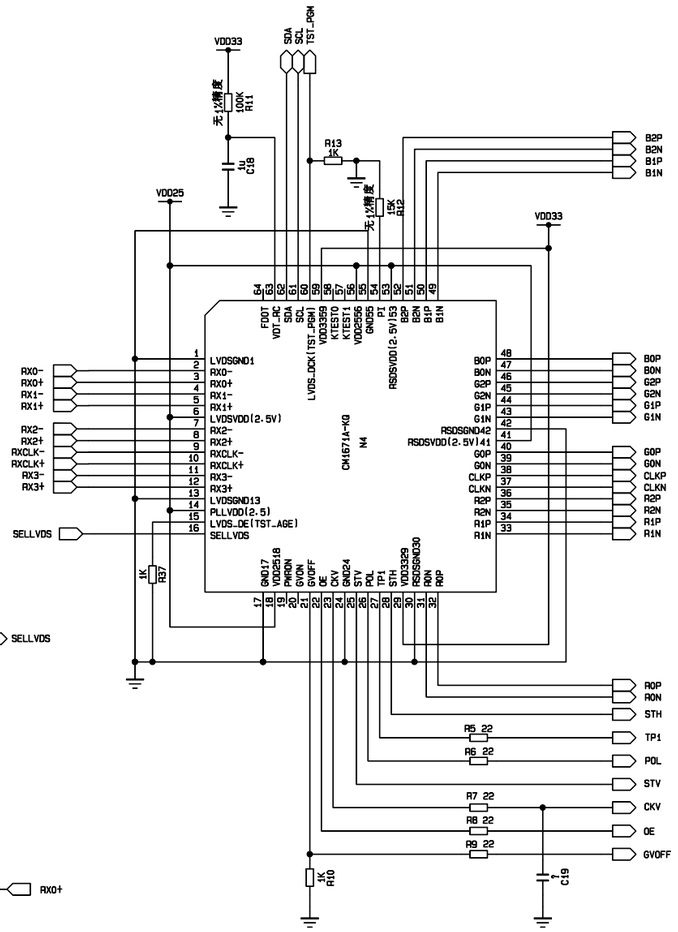


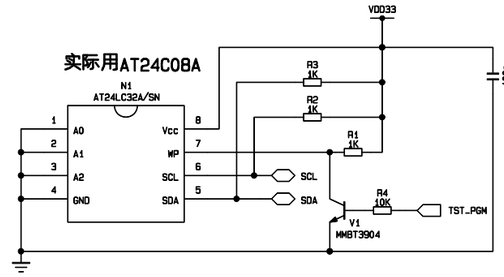
9219HE4001DL
9219HE4201DL
9226HE4001DL

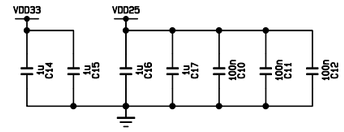
power with four-lamp-tube for backlight board 8/11

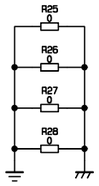


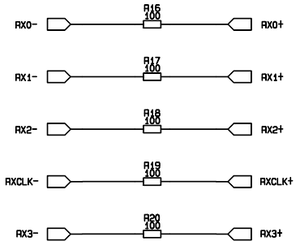


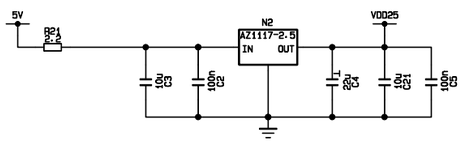


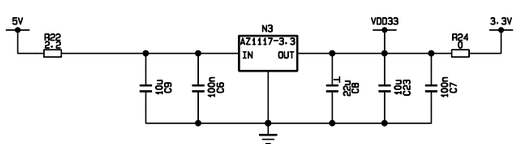


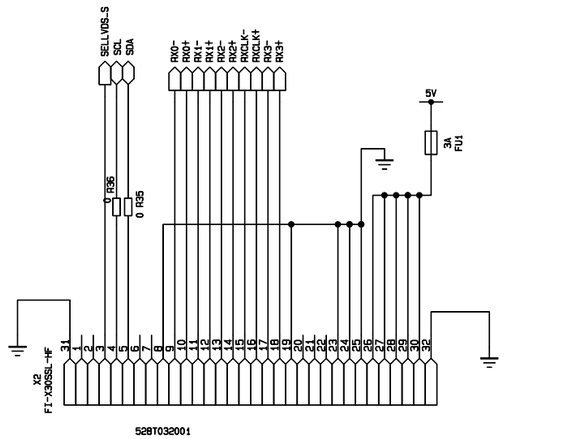






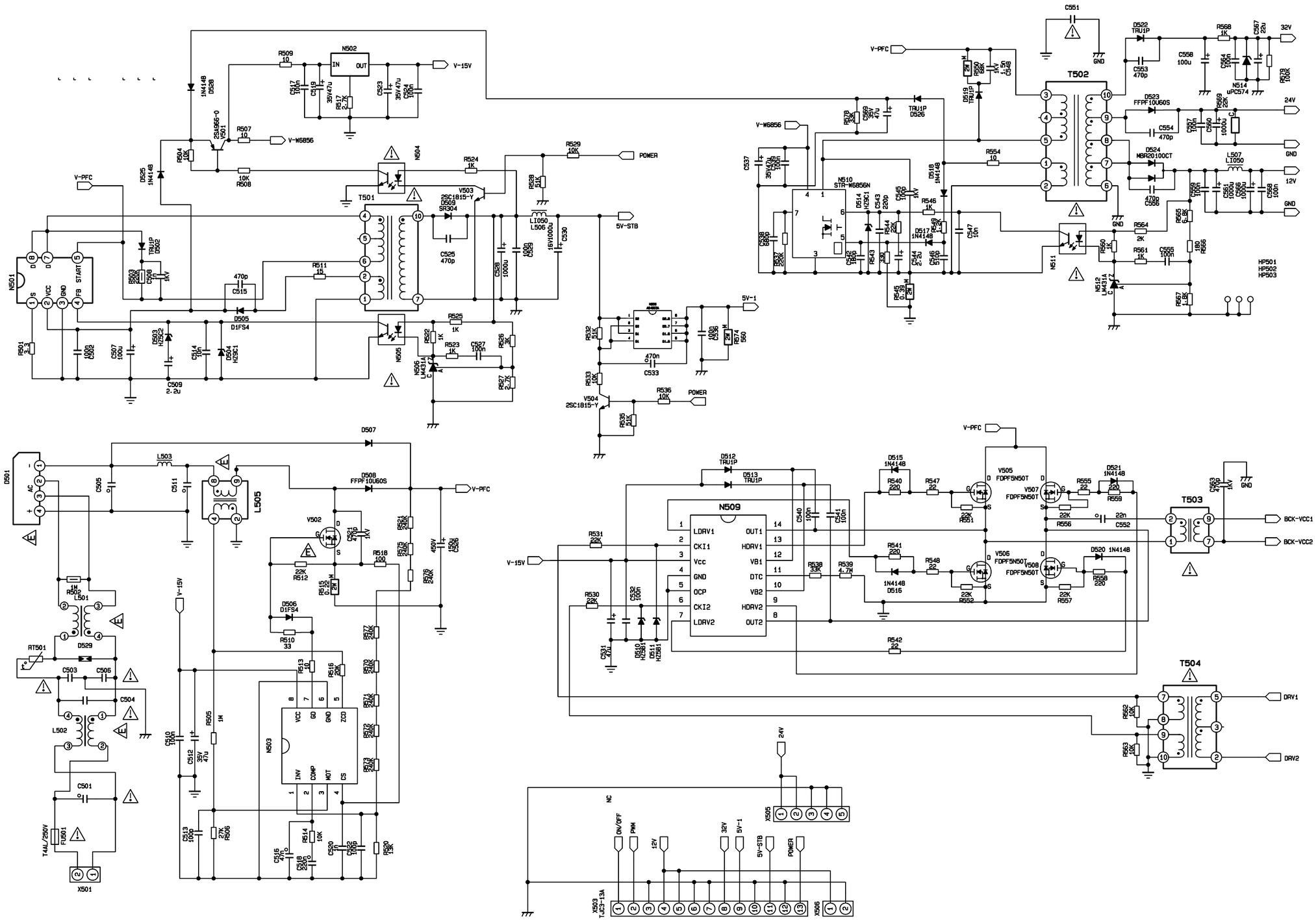






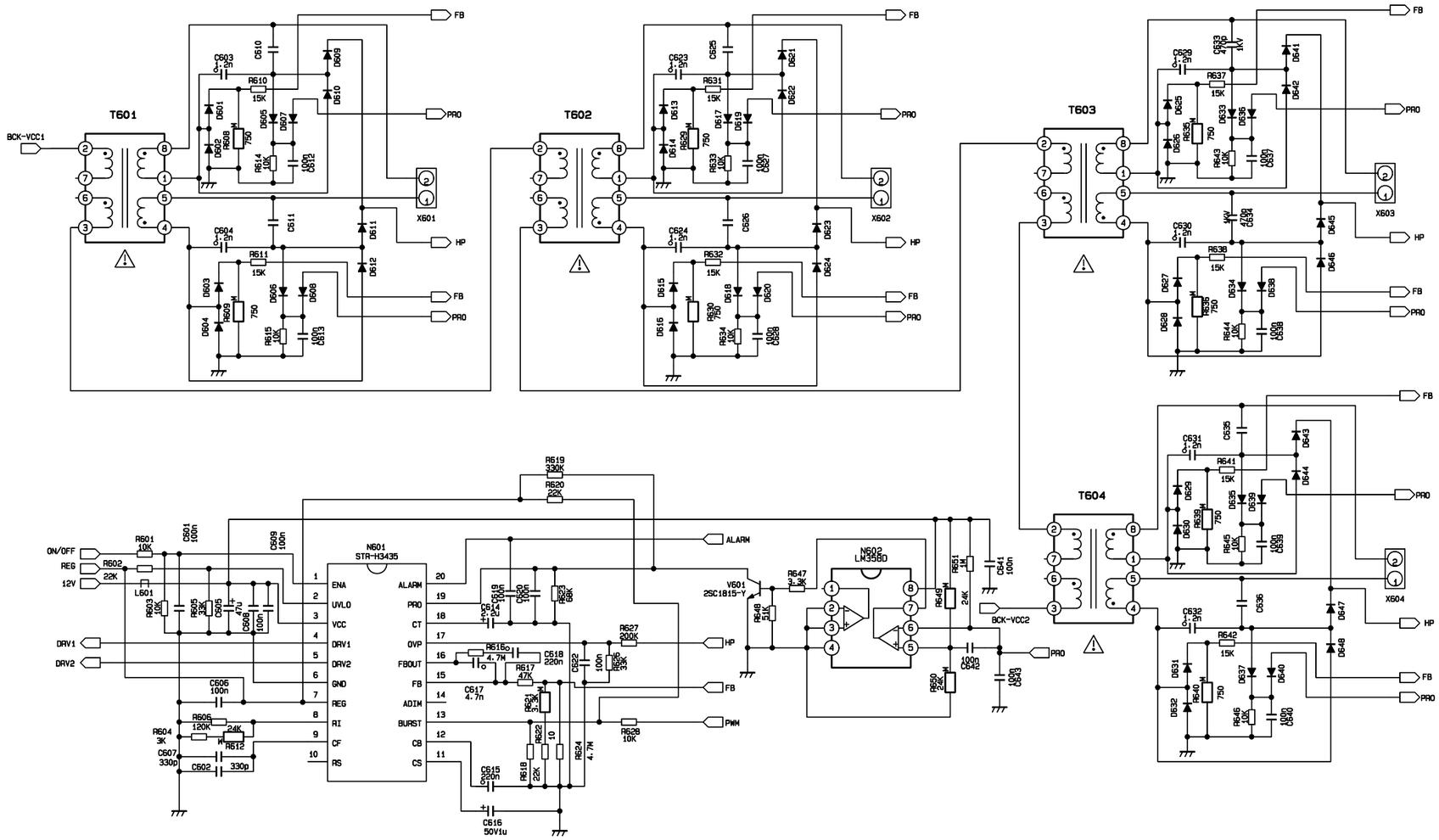
9219HE4001DL
9219HE4201DL
9226HE4001DL

T-CON board 9/11



9219HE4001DL
9219HE4201DL
9226HE4001DL

power 10/11



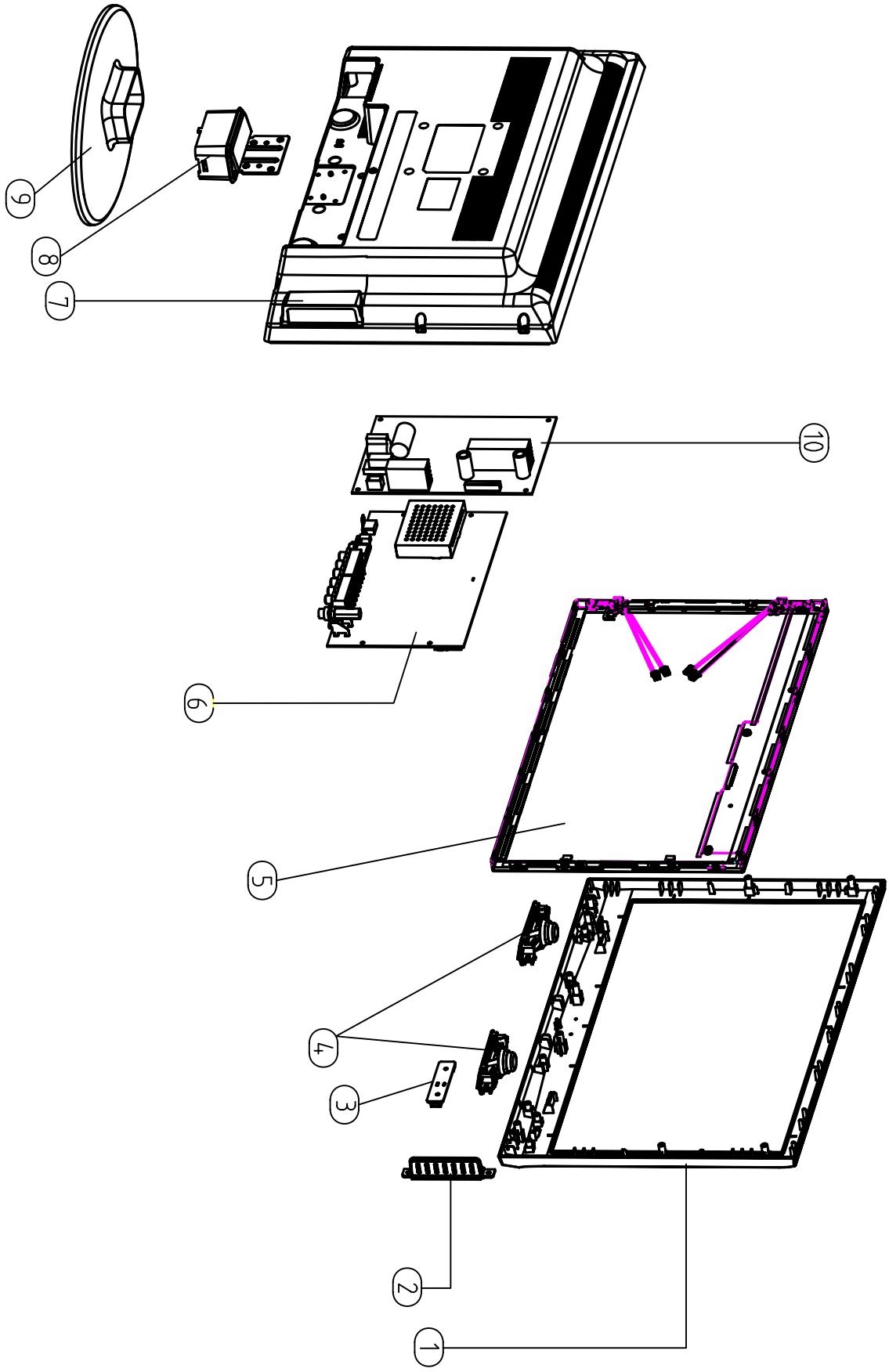
9219HE4001DL
9219HE4201DL
9226HE4001DL

backlight 11/11

APPENDIX-A: Main assembly LCD-19XR9DA

NAME	NO.	MAIN COMPONENT AND IT'S NO.	
Data processing board	XI6HE0346910	N101 N301 N303 N408	MSD119CL (5270119002) R2A10406NP (5271040601) CE6353 (5276353001) TDA7266SA (5267266001)
IR board	XI6HE0350910		
Key board	XI6HE0330510		
Power\back light board	XI6HE0342010		
Remote control	XI6010J017A1	RC-J17-0A	
Panel	XI5203195201	CLAA185WA02	

APPENDIX-B: Exploded view (LCD-19XR9DA)



PART LIST OF EXPLODED VIEW

NO.	DESCRIPTION
1	Front cabinet
2	Key board
3	IR board
4	Speaker
5	Panel
6	Data processing board
7	Back cabinet
8	Stand column
9	Stand
10	Power/back light board
11	User manual
12	Remote Control

PART LIST

LCD-19XR9DA ver.1.0

REF.No.	PARTS No.	DESCRIPION	Q'TY	REMARK
1	XI6619420000	Front cabinet	1	
2	XI6HE0330510	Key board	1	
3	XI6HE0350910	IR board	1	
4	XI6170808000	Speaker	1	
5	XI5203195201	Panel	1	CLAA185WA02
6	XI6HE0346910	Data processing board	1	
7	XI5H1946K02A	Back cabinet	1	
8	XI6156090800	Stand column	1	
9	XI6151201000	Stand	1	
10	XI6HE0342010	Power/back light board	1	
11	XI5944035480	User manual	1	
12	XI6010J017A1	Remote Control	1	

- Only the parts in above list are used for repairing.
- Other parts except the above parts can't be supplied.

Assembling the stand and removing the stand column(Option)

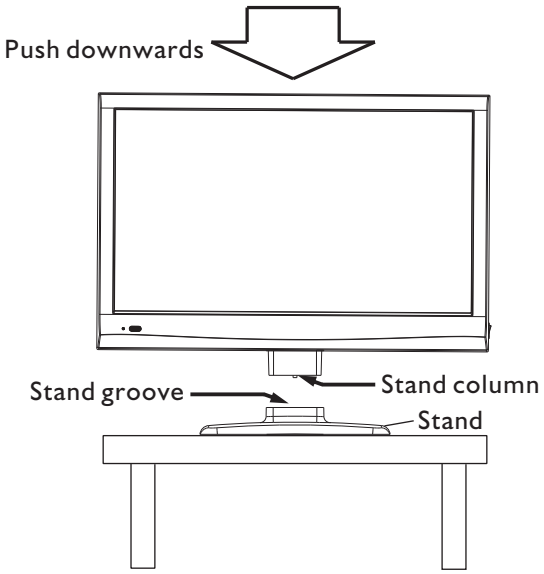
If the stand is provided, please read these instructions thoroughly before attempting this installation.

Safety Precautions:

1. Please read these instructions thoroughly prior to attempting this installation.
2. Be sure to handle this product very carefully when attempting assembly. If you are unsure of your capability, or the use of tools necessary to complete this activity, refer to a professional installer or service personnel. The manufacturer is not responsible for any damages or injuries that occur due to mishandling or improper assembly/installation.
3. When using a table or bench as an aid to assembly, be sure to put a soft cushion or covering to prevent accidental scratching or damage to the unit's finish.
4. The speaker is not intended to support the weight of this display. Do not move or handle this product from the speaker; which can cause damage to the display not covered under the manufacturer's warranty.

Installing the Stand

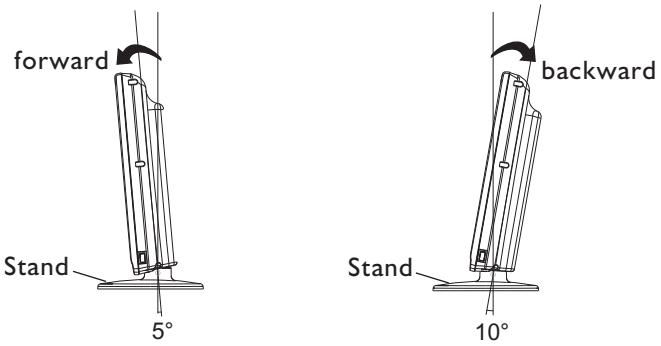
Place the stand on the table, hold the display upright and aim the bottom stand column toward the stand groove, then carefully push the display downwards, fully insert the column into the stand until the lock snaps. Now the stand is assembled.



Adjusting the viewing angle of the TV

Adjust the angle forward up to 5° and backward up to 10° .

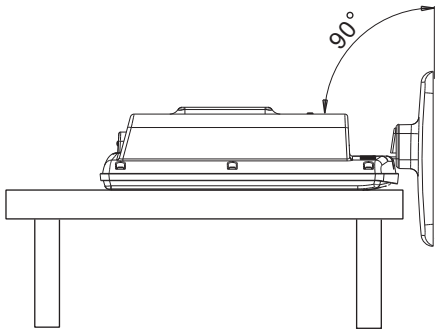
Note: *When adjusting the angle, use caution to avoid slipping or tipping the TV.*



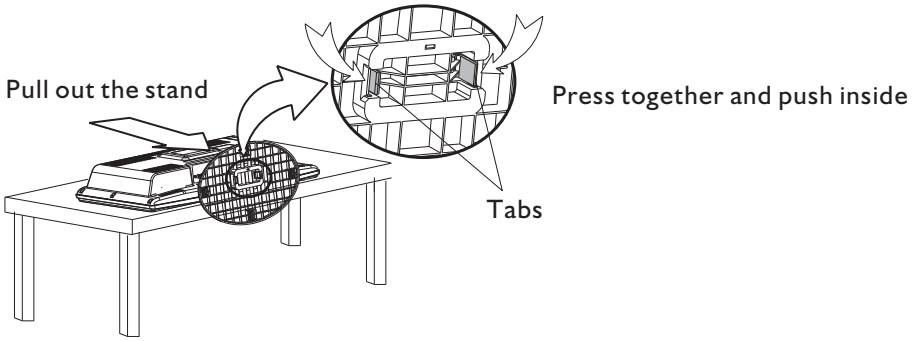
Assembling the stand and removing the stand column(Option)

Detaching the Stand

1.Place carefully the display on its front side with a soft cushion below, shake the stand forward or backward to adjust angle between the stand and the display, let the angle $\leqslant 90^\circ$.



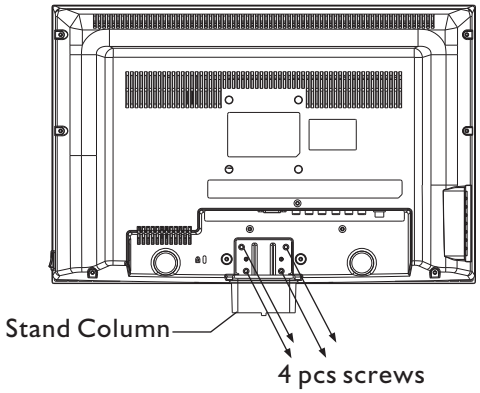
2.Press the two tabs together and push inside properly, and pull out the stand at the same time to detach the stand.



Detaching the stand column

If wall mounting, please detach the stand column.

Place carefully the display on its front side with a soft cushion below, loosen and remove 4 pcs screws, detach the stand column.



NOTE:

1.Appearance of this product in illustrations may differ from your actual product, and is for comparative purposes only.

2.Design of this accessory or display products are subject to change without notice.

WALL MOUNTING INSTRUCTIONS

Safety Precautions:

1. Be sure to ask an authorized service personnel to carry out setup.
2. Thoroughly read this instruction before setup and follow the steps below precisely.
3. The wall to be mounted should be made from solid materials. Only use accessories supplied by the manufacturer.
4. Very carefully handle the unit during setup. We are not liable for any damage or injury caused by mishandling or improper installation.
5. Be sure to place the unit on a stable and soft platform which is strong enough to support the unit.
6. Do not uplift the speaker when moving the display. The appearance of the unit may different from the actual ones.
7. Design and specifications are subject to change without notice.
8. Retain these instructions for future reference.

Note: All the wall mounting parts are optional and may be unavailable in your model.

Below we will show you how to mount the Display on the wall using our company's wall mounting components.

1

Take out these parts from the box.

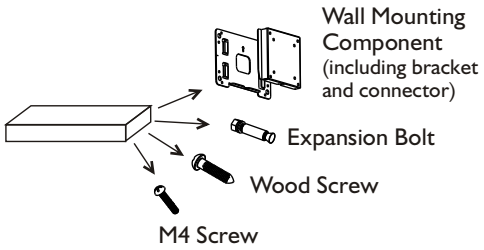


Fig. 1

2

Screw 4pcs expansion bolts to fix the wall mounting bracket on the wall.

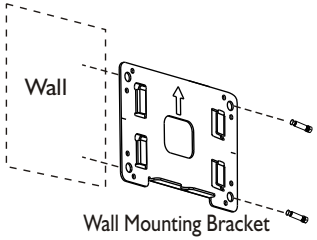


Fig. 2a

If your wall is a wooden structure, please fix the wall mounting bracket on the wall with 8 pcs wood screws.

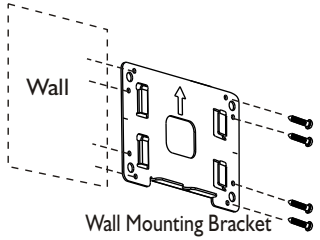


Fig. 2b

3

Use the 4pcs M4 screws to fix the wall mounting connector to the rear of the display unit.

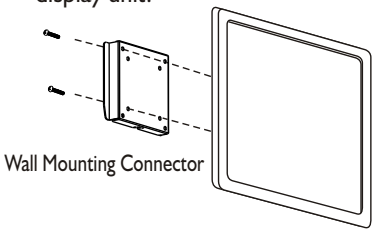


Fig. 3

4

Fully insert the two insertions on the wall mounting connector into the locating grooves on the wall mounting bracket from top to bottom end.

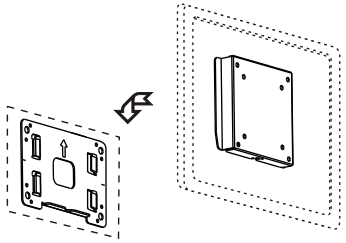


Fig. 4

5

Use screwdriver to revolve the Clasper to the Positioner following the direction of the arrow.

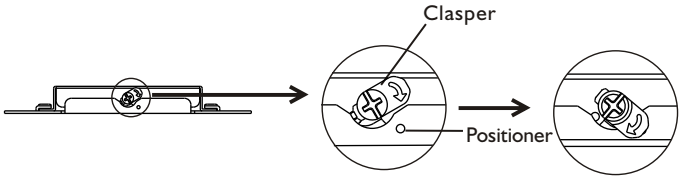


Fig. 5

June/2009

SANYO Electric Co., Ltd.